DENON

Hi-Fi Component Tuner Amplifier

For European Model

SERVICE MANUAL
MODEL DRA-750

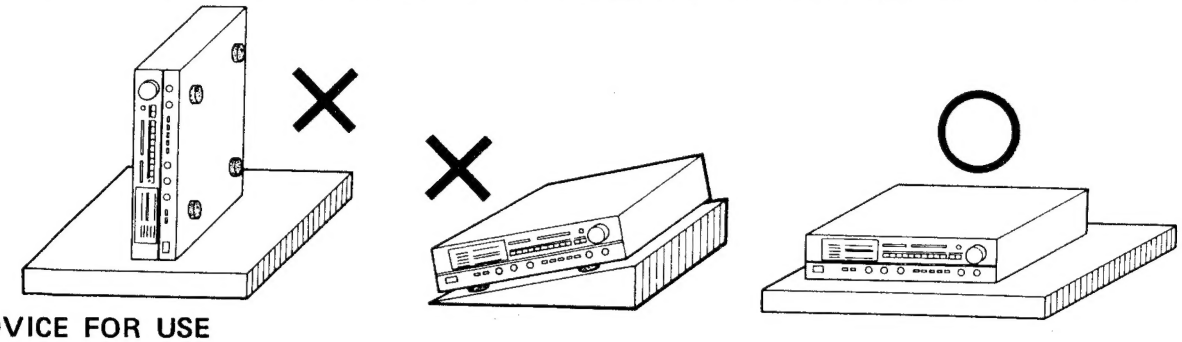
SOLID STATE
TUNER AMPLIFIER

CONTENTS

NIPPON COLUMBIA CO., LTD.

PRECAUTIONS FOR INSTALLATION

DRA-750 uses a newly developed heat emitting unit by employing heat pipes. Since the heat pipes contain a coolant, the DRA-750 must be set level or the desired heat emitting effect cannot be achieved. Always install this unit horizontally.



ADVICE FOR USE

- Do not place the set in direct sunlight, in hot areas such as near heating equipment, with high humidity or dust levels. This may cause damage to the unit.
- Check that all parts are connected correctly before turning on the power source.
- When user is absent for long periods, be sure to remove plug from wall socket.
- Do not use insecticide, benzene or thinner near the unit, or the cabinet color will fade. Avoid using polish: use a soft cloth (e.g. silicon cloth).
- Although the unit is designed to support weight, it is recommended that the user does not place anything too heavy on it. Consider air circulation before placing anything on the unit. If you place any equipment likely to induce hum, make sure there is enough space to between each piece of equipment prevent such hum.

SPECIFICATIONS

AMPLIFIER SECTION

Continuous Power Output:	70 W + 70 W at 8 ohm, 85 W / 8 ohm DIN
Power Bandwidth (IHF):	5 Hz ~ 40 kHz (THD 0.05% both ch. driven at 8 ohm)
Total Harmonic Distortion (20 Hz to 20 kHz):	–3 dB power into 8 ohms 0.008%
Intermodulation Distortion (60 Hz : 7 kHz, 4 : 1 SMPTE):	rated power into 8 ohms 0.005%
Damping Factor:	More than 80 (at 1 kHz, 8 ohms)

PREAMPLIFIER SECTION

Frequency Response:	PHONO RIAA Standard Curve (Recording Output) (MM) 20 Hz ~ 20 kHz ±0.3 dB (MC) 50 Hz ~ 20 kHz ±0.5 dB TAPE, VIDEO/AUX, DAD/AUX 20 Hz ~ 50 kHz ±1.5 dB
Input Sensitivity and Impedance:	PHONO MM 2.5 mV 47 k ohm MC 0.25 mV 100 ohm TAPE, VIDEO/AUX, DAD/AUX 150 mV 33 k ohm
Maximum Input Level (at 1 kHz):	PHONO MM 200 mV MC 20 mV
Signal to Noise Ratio (IHF-A):	PHONO MM @ 5.0 mV input 90 dB MC @ 0.5 mV input 74 dB TAPE, VIDEO/AUX, DAD/AUX @ 150 mV input 95 dB
Tone Control Range:	BASS at 100 Hz ±8 dB TREBLE at 10 kHz ±8 dB
Loudness Control Effect:	VARIABLE LOUDNESS "10" POSITION +10 dB / +5 dB
Subsonic Filter Effect:	15 Hz / –6 dB oct.

TUNER SECTION

[FM]

Receiving Range:	87.5 ~ 108 MHz
Usable Sensitivity:	0.9 μV (10.3 dBf)
50 dB Quieting Sensitivity:	MONO 2.0 μV (17.2 dBf) STEREO 23 μV (38.5 dBf)
Signal to Noise Ratio:	MONO 83 dB STEREO 81 dB
Total Harmonic Distortion 1 kHz:	MONO 0.1% STEREO 0.3%
Selectivity:	70 dB (±400 kHz)
Capture Ratio:	1.5 dB
Image Rejection:	75 dB
AM Suppression:	60 dB
Frequency Response:	30 Hz ~ 15 kHz $^{+0.2}_{-1.5}$ dB
Stereo Separation:	50 dB (1 kHz)
IF Rejection:	85 dB

[AM]

Receiving Range:	522 ~ 1611 kHz
Usable Sensitivity:	18 μV
Signal to Noise Ratio:	55 dB

GENERAL

Power Supply:	AC 220 V, 50 Hz
Power Consumption:	150 W
Dimensions:	434 mm (W) x 112 mm (H) x 400 mm (D) (17-3/32" x 4-13/32" x 15-3/4")
Weight:	9.0 kg (19 lbs 14 oz)

Design and specifications are subject to change without prior notice.

NOTE: This Service Manual is prepared base on Gold Version.

NAME AND FUNCTION OF PARTS
FRONT PANEL

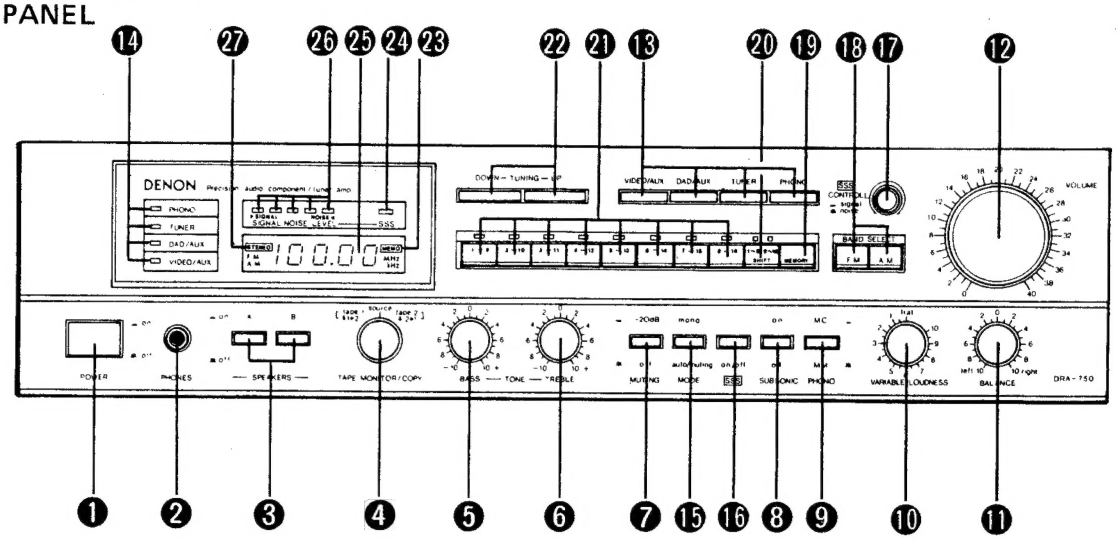


Fig. 1

① POWER (Power Switch)
② PHONES (Head Phone Jack)
③ SPEAKERS (Speaker Select Switch)
④ TAPE MONITOR/COPY
⑤ BASS (Bass Control)
⑥ TREBLE (Treble Control)
⑦ MUTING (Muting Switch)
⑧ SUBSONIC FILTER (Subsonic Filter Switch)
⑨ PHONO (Cartridge Select Switch) ▁ : MC ▙ : MM
⑩ VARIABLE LOUDNESS
⑪ BALANCE (Balance Control)
⑫ VOLUME (Volume Control)
⑬ FUNCTION (Input Select Switch)
• PHONO, • TUNER, • DAD/AUX, • VIDEO/AUX
⑭ FUNCTION INDICATOR
⑮ MODE (FM Mode, Muting and Tuning Mode Switch)
▙ : auto/muting, ▁ : mono
⑯ SSS ON/OFF (See Page 12 for Details Regarding the SSS)
⑰ SSS CONTROLLER (SSS Control Knob)
⑱ BAND SELECT (Band Selector Buttons)
• AM, • FM
⑲ MEMORY (Memory Button)
⑳ SHIFT (Shift Button)
㉑ PRESET CHANNEL 1 ~ 16 (Station Presetting Buttons)
㉒ TUNING (Tuning Buttons)
UP, DOWN
㉓ MEMORY INDICATOR
㉔ SSS (SSS Indicator)
㉕ DIGITAL FREQUENCY INDICATOR
㉖ SIGNAL/NOISE LEVEL (Signal/Noise Level Indicator)
㉗ STEREO (Stereo Indicator)

BACK PANEL

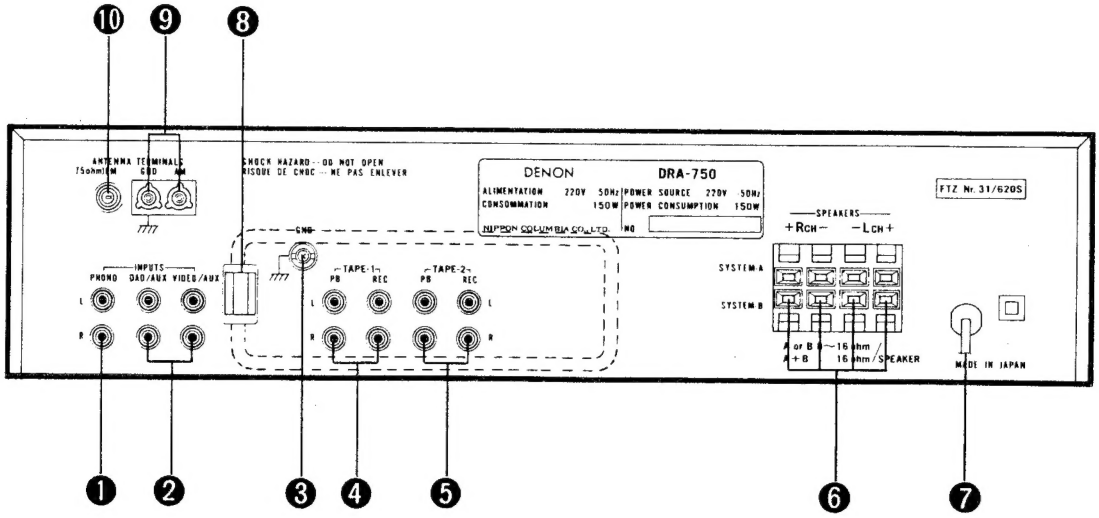


Fig. 2

① PHONO (Phono Input Terminals)
② DAD/AUX, VIDEO/AUX (Input Terminals)
③ GND (Grounding Terminal)
④⑤ TAPE-1, -2 (Playback and Recording Terminals)
⑥ SPEAKERS (Speaker Terminals)
⑦ AC Cord (Power Cord)
⑧ AM LOOP ANT (AM Loop Antenna)
⑨ AM ANT (AM Antenna Terminal)
⑩ FM ANT 75 ohm (FM Antenna Terminal)

CONNECTIONS

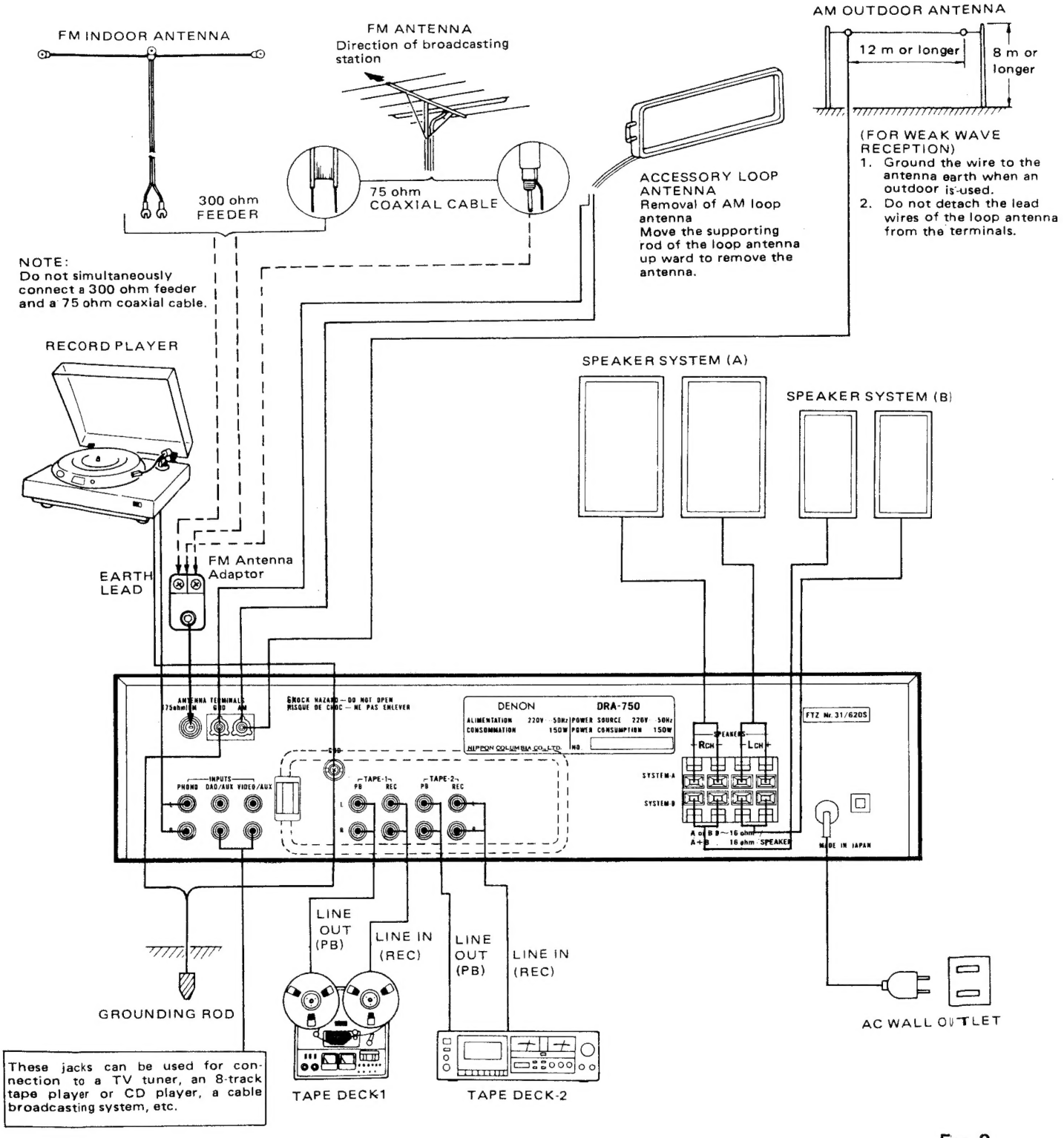


Fig. 3

- Do not plug the power source cord into an AC outlet until all the connections are completed.
- Connect the right (R) channel plug to the right (R) channel jack, and the left channel plug to the left channel jack.
- Insert the plugs firmly into the corresponding jacks. If a connection is incomplete, noise may be generated.
- Plug the power source cord for audio equipment into the AC OUTLET terminal. Do not use this terminal for other electric appliances such as hair dryer. (NOT INCLUDED IN SYSTEM FOR EUROPEAN USE)
- Do not bundle the pin plug cords with the power source cord and do not place the pin plug cords near the power transformer, or humming and other noise may be generated.
- Always connect the pin plug cord to the input terminal "PHONO" because this terminal is highly sensitive. If this terminal is not connected, induction hum may be generated.

ANTENNA INSTALLATION

- T TYPE FM INDOOR ANTENNA

  The T type indoor antenna (300 ohm) can be used inside wooden houses when FM stations are local and strong signals can be received. While receiving an FM program, extend the horizontal part of the antenna. Orient the T-shaped part for optimal reception and mount the antenna on the wall or ceiling.

  * In general, FM indoor antennas might not consistently assure stable reception, due to environmental changes. Use an FM indoor antenna temporarily until an outdoor antenna is installed.

- FM OUTDOOR ANTENNA CONNECTION (Fig. 4)

  75 ohm coaxial cable (3C–2V, 5C–2V) is preferable to obtain better performance of the tuner.

  * Contact your local dealer for details on selection and installation of the FM outdoor antenna.
  * When a 300 ohm FM antenna is connected by a 75 ohm coaxial cable, a matching transformer is required.

- AM ANTENNA CONNECTION (Fig. 5)

  Since the model is provided with a high performance AM loop antenna on the back panel, this accessory antenna can effectively be used for optimal reception in places where broadcasting stations are located nearby and relatively strong signals are received with low noise.

  Orient the loop antenna horizontally to obtain optimal reception.

  In places where strong, clear signals are not received due to particular location and/or environmental conditions, connect an insulated wire to the AM antenna terminals and attach it to the wall. In places where broadcasting stations are located too far away and only weak signals are received, or where signals are blocked by obstacles, install an AM outdoor antenna.

  * Even if an AM outdoor antenna is installed, do not detach the AM loop antenna.

GROUNDING

If there is much noise during reception, it is recommended that a grounding wire be used.

Connect a thick insulated wire to the "GND" terminal, and wind the unconnected bare end around a metal water pipe, a grounding rod, or a grounded copper plate.

* Never connect grounding the wire to a gas pipe. This could cause fire or explosion.

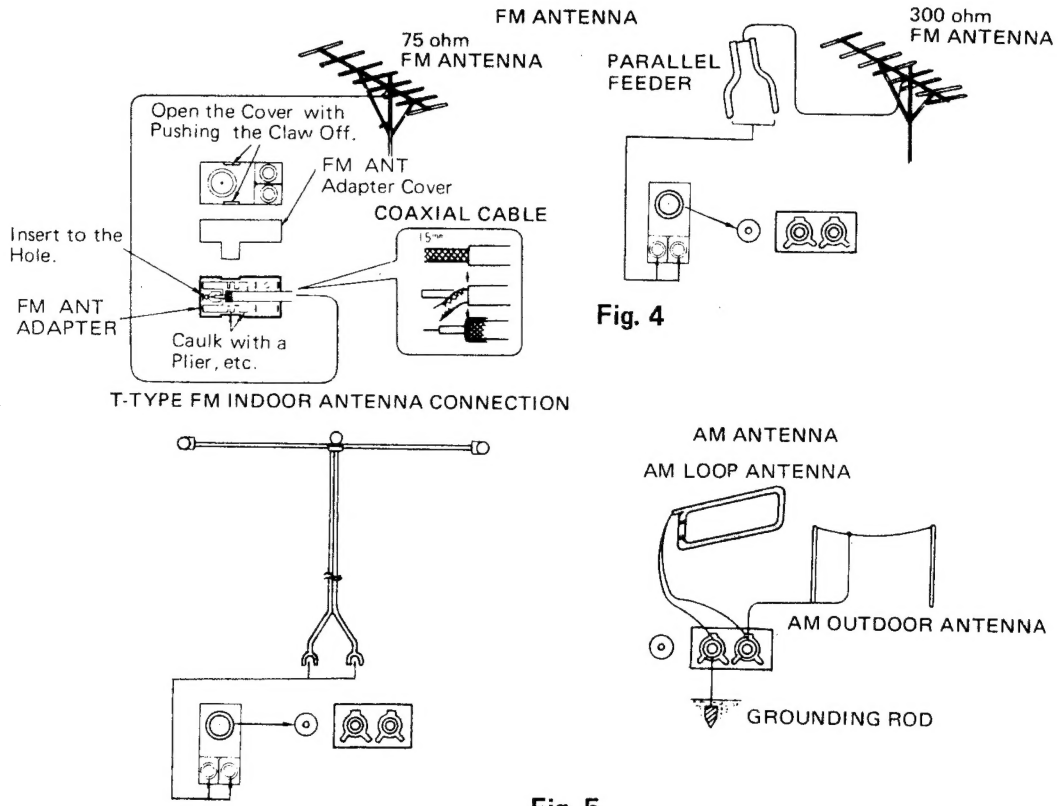


Fig. 4

Fig. 5

Note: Two FM antennas should not be connected simultaneously. Even if an external AM antenna is used, the LOOP antenna connects with an AM loop antenna terminals on the back panel. Be sure the lead terminal does not touch the metal part of back panel.

BLOCK DIAGRAM

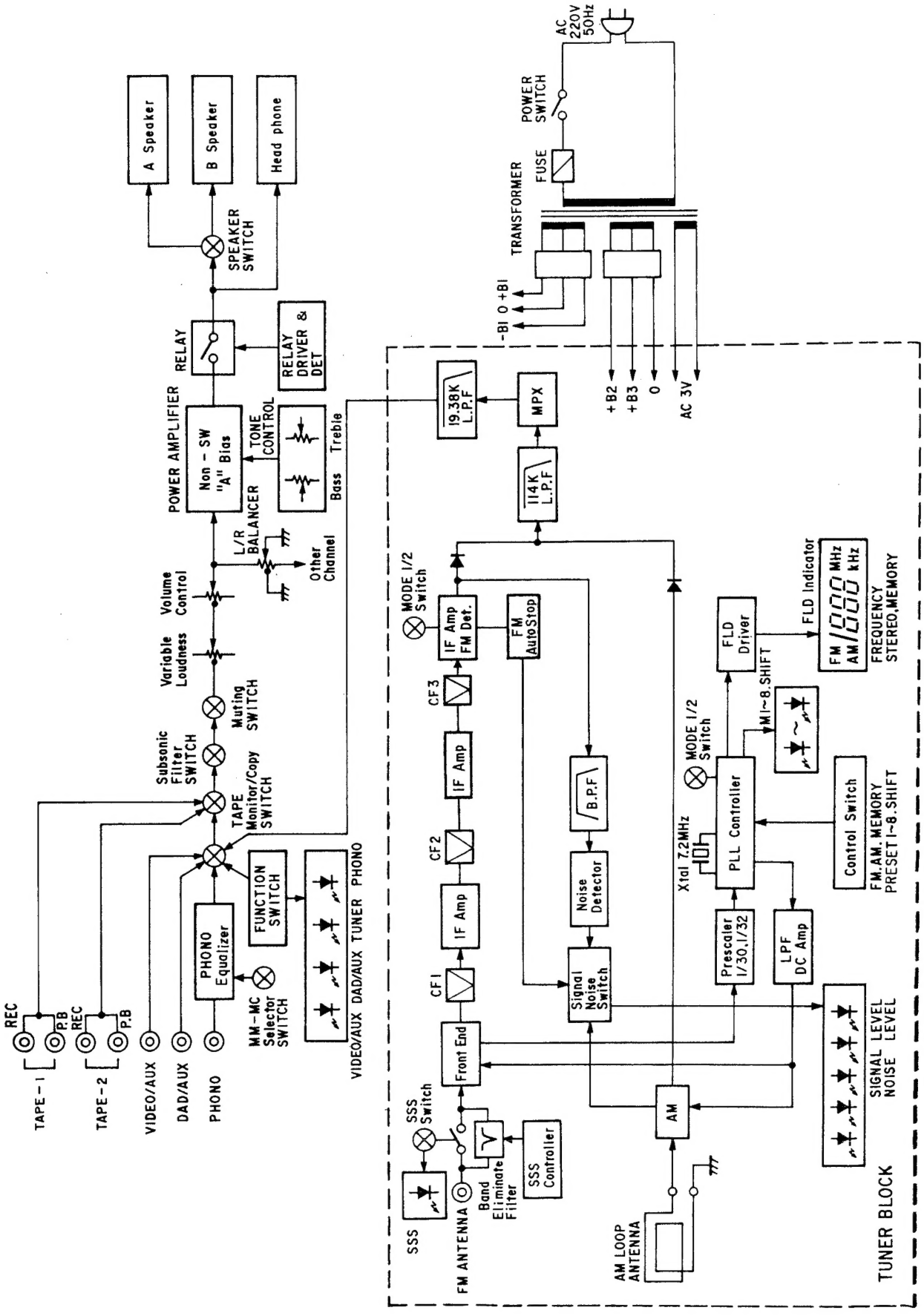


Fig. 6

METHOD OF ADJUSTMENTS

When making adjustments, be sure the power supply is at the rated voltage and the room air is in normal condition with respect to temperature and humidity.

• AMPLIFIER SECTION

1. IDLING CURRENT (Fig. 7)

(1) Set controls as follows.

POWER Switch →off (■)
VOLUME Control →0 (min.)
SPEAKERS →off (■)
Temperature →15°C ~30°C
VR3 and VR4 of the ETC9028-1 (POWER PRE Unit) →Center
Power supply →AC 220 V, 50 Hz.

(2) Connect Digital Voltmeter to the test points 38 (+), 39 (-) and 35 (+), 36 (-) of the ETC9028-1.

(3) Turn the Power Switch on and rotate VR3 clockwise so that the Digital Voltmeter reads 1mV ±0.2 mV DC at the test point 38,39. Follow the same procedure to VR4 for test point 35,36.

(4) Warm up one minute, then readjust VR3 and VR4 as in step (3) so that the Digital Voltmeter reads 1.5 mV ±0.3 mV DC.

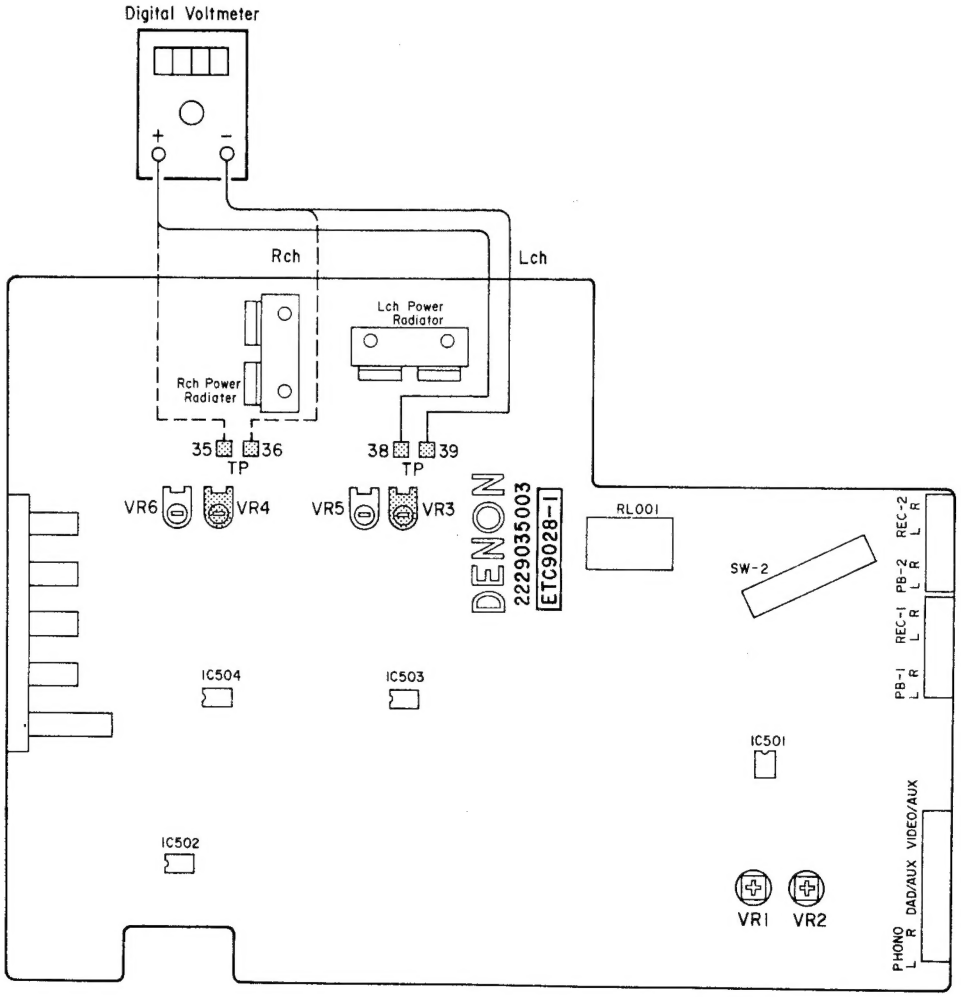


Fig. 7

- **POWER AMP SECTION**

2. DISTORTION (Fig. 8)

(1) Connect 8 ohm resistors across the Speaker Terminals.
(2) Turn the Power Switch on.
(3) Set the Volume Control to "16".
(4) Apply 20 kHz sine wave to DAD/AUX input terminal and adjust output level of the Oscillator so that 17Vrms are delivered across the 8 ohm resistor. (Apply both L and R-ch)
(5) Adjust VR5 (L-ch) and VR6 (R-ch) for minimum distortion.

- **EQ. AMP SECTION**

3. NEUTRAL POINT (Fig. 8)

(1) Set controls as follows.
TAPE MONITOR Switch — source
INPUT SELECTOR Switch — PHONO (PHONO INPUT . . . . . Short)
VOLUME Control — 0 (min.)
(2) Connect Digital Voltmeter to REC-1 and REC-2 output Terminal.
(3) Turn the Power Switch on.
(4) Warm up 5 to 10 minutes, then adjust VR1 so that the DC Voltmeter reads 0 ±1mV at REC-1. Follow the same procedure to VR2 for REC-2.

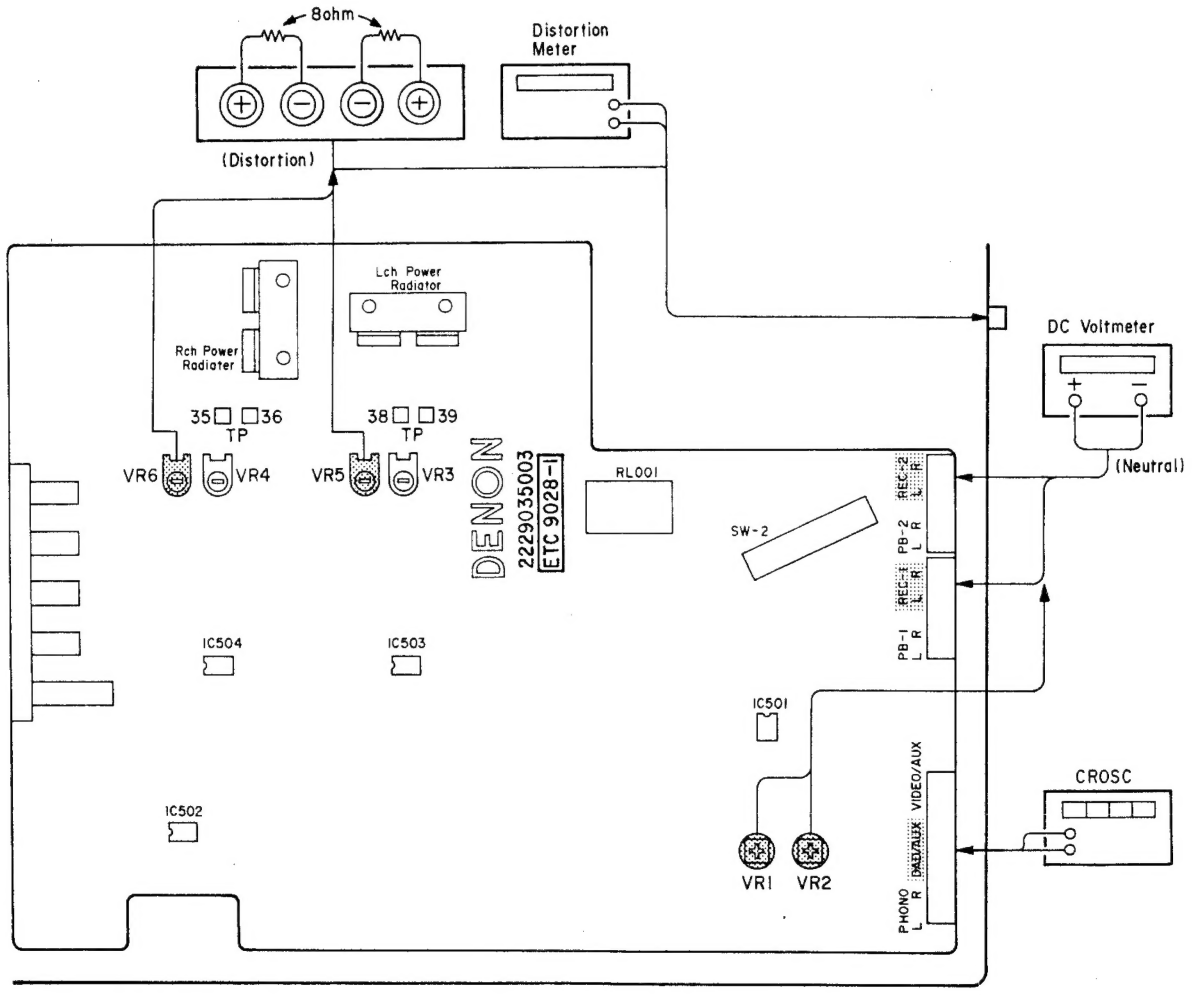


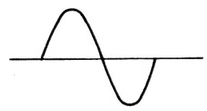
Fig. 8

• **Tuner Section**

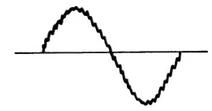
ADJUSTMENT OF RF TRAP UNIT (ETC0658J) (SSS on, MODE ⎓ mono)

Table 1

	Adjustment Item	Tuning	Input Side				Output Side			Adjustment Point	Adjustment Value
			Measuring Instrument	Frequency	Input Level	Modulation	Connection Point	Measuring Instrument	Connection Point		
1	88 MHz Tracking Check	88.00 MHz	FM SSG	88.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz 100%	Antenna Terminal	Digital Voltmeter	VC. G	–	3 V ± 10 mV at the time of adjustment to the max. point of output waveform attenuation using the SSS controller
2	108 MHz Tracking Check	108.00 MHz	FM SSG	108.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz 100%	Antenna Terminal	Digital Voltmeter	VC. G	–	20 V ±100 mV at the time of adjustment to the max. point of output waveform attenuation using the SSS controller
3	If NG in items 1 and 2, advance to items 4 to 6										
4	108 MHz Tracking	108.00 MHz	FM SSG	108.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz 100%	Antenna Terminal	Oscilloscope	Output (L)	TC1	Output waveform attenuation is max. at 20 V ± 50 mV
5	88 MHz Tracking	88.00 MHz	FM SSG	88.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz 100%	Antenna Terminal	Oscilloscope	Output (L)	L1	Output waveform attenuation is max. at 3 V ± 5 mV
6	Repeat the adjustment in items 4 and 5 so that the waveform attenuation is maximum at the rated voltage										
7	Adjustment of Attenuation	98.00 MHz	FM SSG	98.0 MHz	Variable depending on output waveform attenuation	Mono 1 kHz 100%	Antenna Terminal	Oscilloscope	Output (L)	VR1	Adjust to max. attenuation after adjustment to the max. point of output waveform attenuation using the SSS controller



Normal Output Waveform



Distortion of Output Waveform due to Input Attenuation

Fig. 9

FM

Table 2

	Adjustment Item	Tuning	Input Side				Output Side			Adjustment Point	Adjustment Value	Remarks
			Measuring Instrument	Frequency	Input Level	Modulation	Connection Point	Measuring Instrument	Connection Point			
1	76 kHz	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Mono 1 kHz, 100%	Antenna Terminal	Frequency Counter	TP-3, 4	VR101	76 kHz ± 50 Hz	
2	Center Adjustment	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Mono 1 kHz, 100%	Antenna Terminal	Tuning Meter Jig	TP-1, 2	T1	Tuning Meter Center	
3	Mono Distortion	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Mono 1 kHz, 100%	Antenna Terminal	Distortion Meter	Output (L)	T2	Min. Distortion	
4	Stereo Distortion	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Stereo (L) 1 kHz Main 90% Pilot 10%	Antenna Terminal	Distortion Meter	Output (L)	IFT on Front End	Min. Distortion	
5	Tuning Center Distortion Adjustment	Repeat items 2 to 4 so that the tuning meter may indicate its center value, and the distortion is minimum at tuning time										
6	Noise Indicator LED ON Level	98.00 MHz	FM SSG	98.0 MHz	–3 dBμ	Mono 1 kHz, 100%	Antenna Terminal	–	–	VR4	5th Noise LED ON	By SSS controller in noise mode
7	Signal Indicator LED ON Level	98.00 MHz	FM SSG	98.0 MHz	55 dBμ	Mono 1 kHz, 100%	Antenna Terminal	–	–	VR3	5th Signal LED ON	By SSS controller in signal mode
8	Separation	98.00 MHz	FM SSG	98.0 MHz	60 dBμ	Stereo (L) 1 kHz Main 90% Pilot 10%	Antenna Terminal	Voltmeter	Output (L) Output (R)	VR102	Max. Separation (balance of directivity)	19/38 kHz L.P.F. is used

AM

1	IF Adjustment	No-broadcasting Frequency	AM IF Sweep	–	No-IF Waveform Distortion Level	–	AM Antenna Terminal	Monitor Scope	R208	T203	Flat at Max. IF Waveform	
2	522 kHz Tuning Voltage	522 kHz	–	–	–	–	–	Digital Voltmeter	R201	T201	1.2 V ± 20 mV	
3	1611 kHz Tuning Voltage	1611 kHz	–	–	–	–	–	Digital Voltmeter	R201	TC201	8 V ± 100 mV	
4	Repeat items 2 and 3 to obtain rated tuning voltage											
5	603 kHz Tracking	603 kHz	AM SSG	603 kHz	Non-AGC Level	400 Hz, 30%	Loop Antenna	Voltmeter	Output (L)	T202	Max. Output	Adjust the SG output not over to work AGC
6	1404 kHz Tracking	1404 kHz	AM SSG	1404 kHz	Non-AGC Level	400 Hz, 30%	Loop Antenna	Voltmeter	Output (L)	TC202	Max. Output	Adjust the SG output not over to work AGC
7	Repeat items 5 and 6 to adjust the tracking											
8	Signal Indicator LED ON Level	999 kHz	AM SSG	999 kHz		400 Hz, 30%	Loop Antenna	–	–	–	1st Signal LED ON 55 ± 10 dbμ/m	

CONNECTION DIAGRAM OF MEASURING INSTRUMENTS

• **FM**

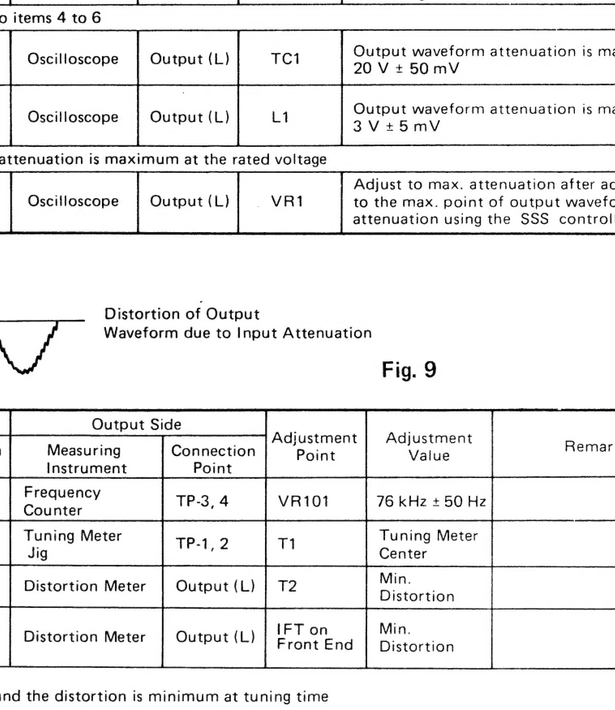


Fig. 10

• **AM**

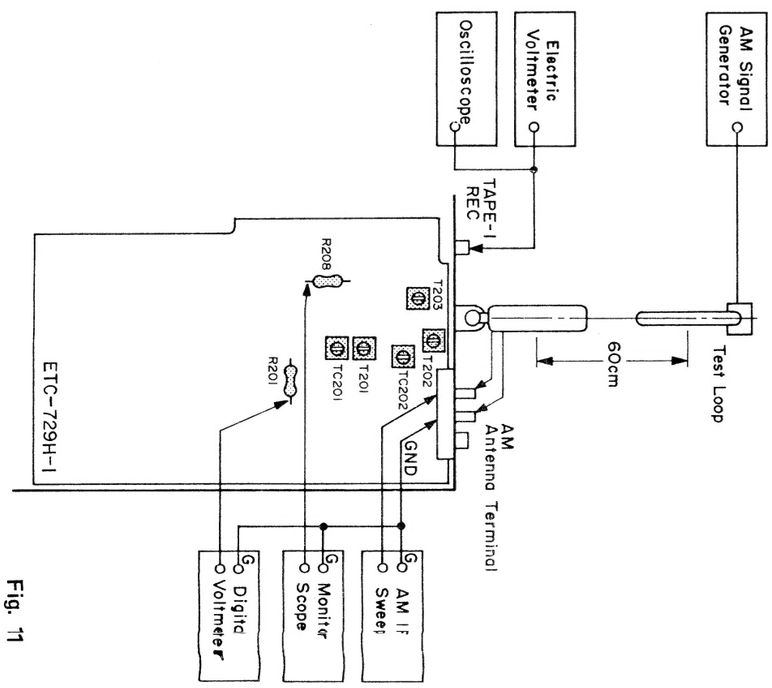


Fig. 11

ROUGH DIAGRAM OF ADJUSTMENT POINT
ETC0729H Tuner Unit (Component Side)

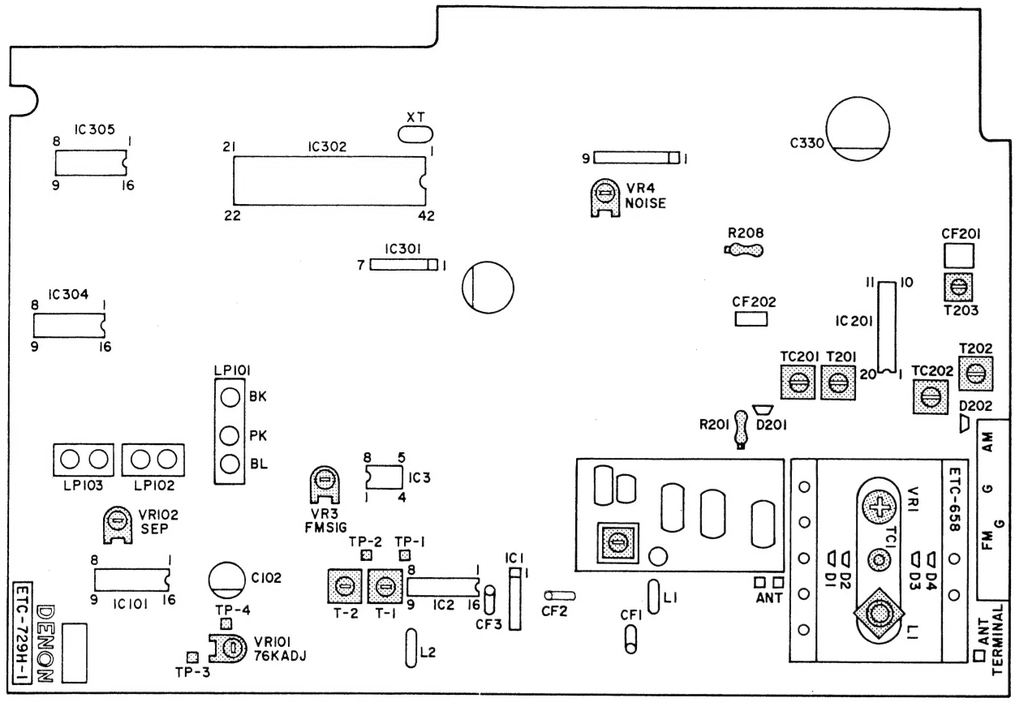


Fig. 12

TUNER METER JIG

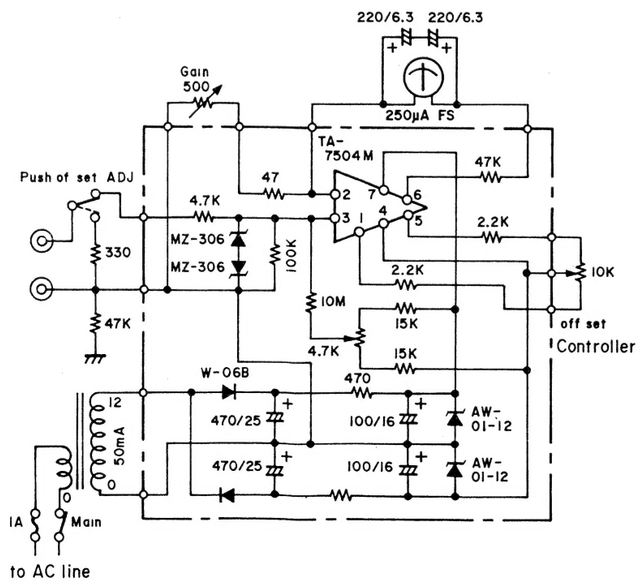
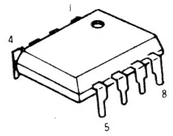


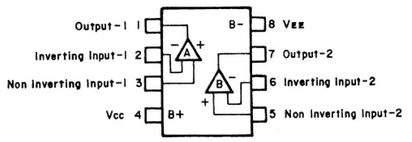
Fig. 13

SEMICONDUCTORS

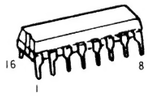
• IC's

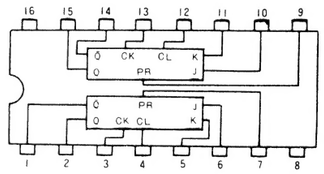
NJM4558DD (JRC)
NJM4558DX (JRC)
NJM2041DD (JRC)
M-5218P (Mitsubishi)



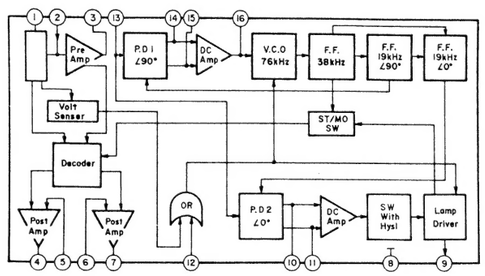


HD14027B
HA12016
HA11225
(Hitachi)

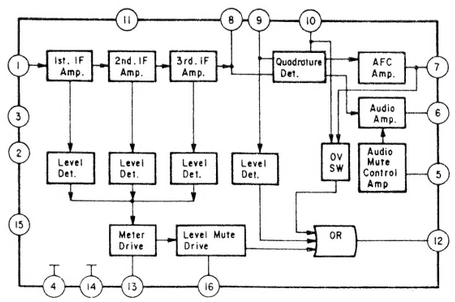




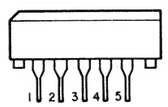
HA12016

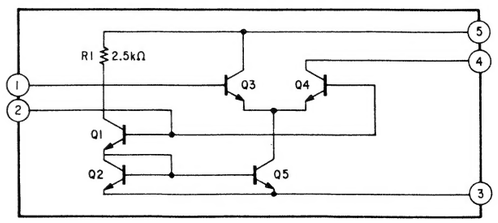


HA11225

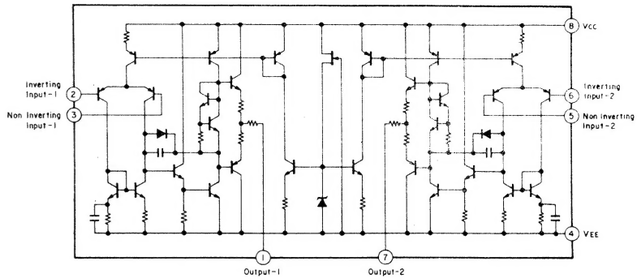


TA7060AP (Toshiba)

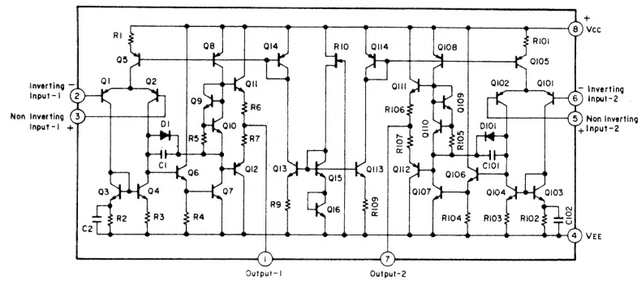




NJM4558DD
NJM4558DX
NJM2041DD

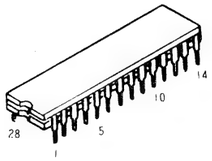


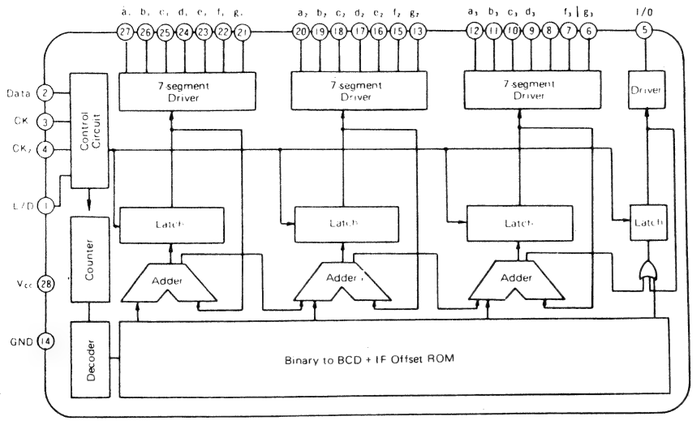
M-5218P



HD14027B

TD6301AP
(Toshiba)



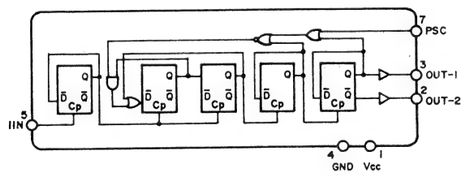


FUNCTIONS OF TERMINALS

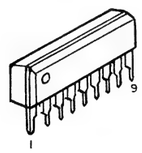
Pin No.	Name	Function
1	L/D	Output status select input terminal. Input terminal for selecting output status by the indicator (LED, FL, LCD).
2	Data	Receiving frequency data input terminal. Input serially by the system controller LSI.
3, 4	CK1 CK2	Received frequency data input control timing input terminal. Transferred simultaneously with data by the system controller LSI.
5	1/0	Segment drive output terminal. 100 MHz-unit display at FM time. Only 1 pin is used for output because of 1 to 0 in both FM/AM.

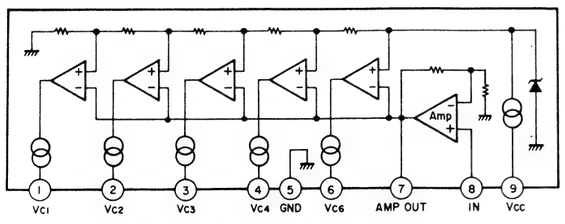
Pin No.	Name	Function
6~12	a^3~g^3	7-segment drive output terminal. 10 MHz-unit display at FM time. 100 kHz-unit display at AM time.
13, 15~20	a^2~g^2	7-segment drive output terminal. 1 MHz-unit display at FM time. 10 kHz-unit display at AM time.
21~27	a1~g1	7-segment drive output terminal. 100 kHz-unit display at FM time. 1 kHz-unit display at AM time.
14, 28	Vcc GND	Supply voltage applying terminal.

TD6104P
(Toshiba)



LB1403
(Sanyo)

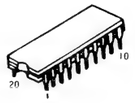


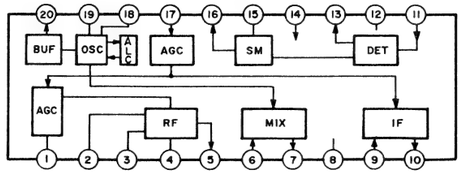


FUNCTIONS OF TERMINALS

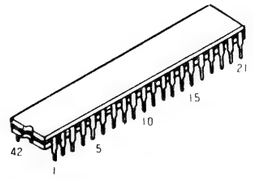
Pin No.	Name	Functions
5	f_{IN}	FM station signal input terminal Frequency range 60 – 140 MHz Input level 75 – 300 mVrms
3	OUT-1	Dividing an input signal into 1/30 or 1/32 through dividing output terminal f_{IN}. Output level 0.5(V)MIN
2	OUT-2	OUT-1 inverted signal output. Because of open emitter system, if it is to be used. External resistor is necessary. Open in general.
7	PSC	Dividing value select control terminal 1/32 when Vpcc ≧ 2(V), 1/30 when Vpcc ≦ 1(V)
6	C	for bias circuit. Connect C = 2200 pF (approx.) between the unit and the GND.
1 4	Vcc GND	Power terminal Vcc = 5V Icc = 5 mA (standard), 10 mA (max.)

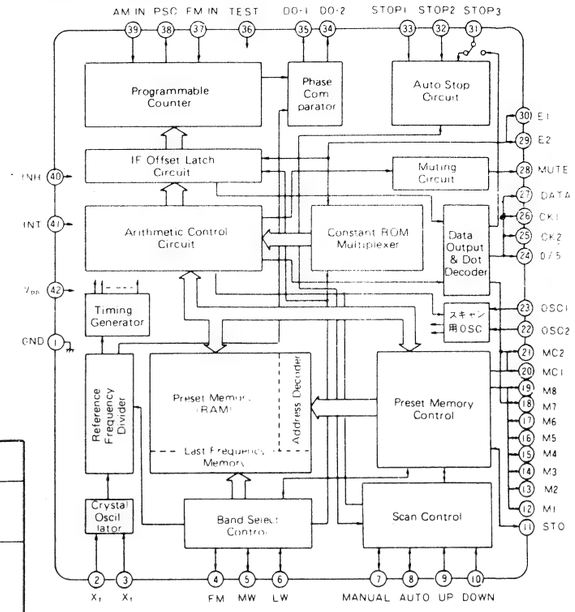
LA1245
(Sanyo)





TC9147BP
(Toshiba)





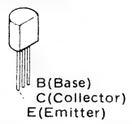
FUNCTIONS OF TERMINALS

Pin No.	Symbol	Name	Function
2	XT	Crystal oscillator terminal	Connects crystal 7.2 MHz for reference frequency.
3	XT		
4	FM	FM band specifying input	Selects FM, MW and LW in the mutual reset mode.
5	MW	MW band specifying input	
6	LW	LW band specifying input	
7	MANUAL	Manual tuning mode specifying input	Selects between manual operation and auto search operation in mutual reset mode at UP/DOWN channel select time.
8	AUTO	Auto search tuning mode specifying input	
9	UP	UP operation key input	UP/DOWN channel selection by connecting a push-key
10	DOWN	DOWN operation key input	
11	STO	Memory store instruction input	With this input, preset memory is set to write enable status.
12 ~ 19	M1~M8	Preset memory channel specifying input	Controls read/write of the internal 16-channel preset memory in conjunction with MC1 and MC2 input.
20 21	MC1 MC2	Memory control input	Sets the 16-channel preset memory to an 8-channel fixed system for FM/AM (MW + LW) or a 16-channel tandem system for FM+MW+ LW (3 bands).
22	OSC2	Oscillator terminal for AM	C/R connecting terminal for oscillator, which determines scan speed at AM search time.
23	OSC1	Oscillator terminal for FM	C/R connecting terminal for oscillator, which determines scan speed at FM search time.
24	0/5	FM Europe 50 kHz output	Europe area FM band 50 kHz step indicating output. Set "H" at 50 kHz.
25 26 27	CK2 CK1 DATE	Received frequency data serial output	Otputs serial data and timing lock to driver TD6301 for receiving frequency digital display. CK1 output is used as Pcc output at the same time.

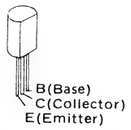
Pin No.	Symbol	Name	Function
28	MUTE	Muting signal output	Set "H" at muting output time.
29 30	E2 E1	Area specify input	Specifies an area, Japan, U.S.A. or Europe.
31	STOP3	AM-IF signal input	Counts IF 450 kHz signals at AM time and stops auto search.
32	STOP2	Auto search stop signal input	If "H" level is input STOP2 when "H" level is set to STOP1, the auto search is stopped. Used for AR1 or stereo channel receiving status discrimination.
33	STOP1	Scan speed slow input	When "H" level is input, reduces the auto search scan speed to 1/2.
34 35	DO-2 DO-1	Phase comparator output	Two tristate buffers are output in parallel from a single phase comparator.
36	TEST	Test terminal	Sets test mode with "H" level input.
37	FM_{IN}	FM programmable counter input	Connects the output of precaller TD6104P.
38	PSC	Prescaller control output	Controls dividing (1/30, 1/32) of the prescaller TD6104P.
39	AM_{IN}	FM programmable counter input	Inputs AM channel signal.
40	INH	Inhibit input	Oridinary operation at "H" level, and inhibit status at "L" level.
41	INT	Initialize input	Ordinary operation at "H" level, and initialization of internal status at "L" level
42 1	V_{DD} GND	Power applying terminal	Applies 5 ± 0.5 V. Up to 2 V is available as backup.

• TRANSISTORS

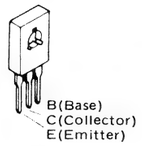
2SC1685(R)
2SA988(E/F)
2SC461(C)
2SC1815(BL)
2SC1841(E/F)
2SA564A(R)



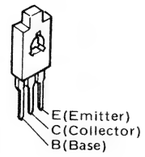
2SB647A(C)
2SD667A(C)



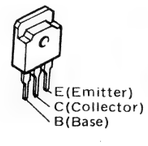
2SA1184(Y/O)
2SD882(Q/P)
2SC2824(Y/O)



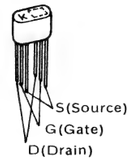
2SD1406(Y/GR)



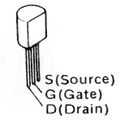
2SA1106(Y/O)
2SC2581(Y/O)



FET
2SK240(BL)/(V)

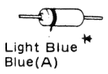


FET
2SK163M



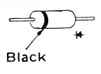
• DIODES (including LED)

1S2076
1S2076A

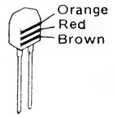


1N60

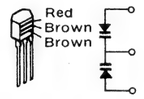
HZ6-B2 HZ-16-2
HZ7C-2 HZ22-2
HZ-15-2
HZ-9B-2



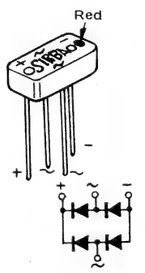
Varactor
SVC321SP-D2



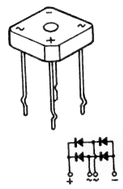
Twin Varactor
SVC211SP-B



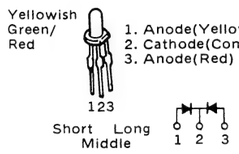
S1RBA20F



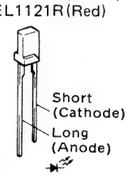
S4VB20F



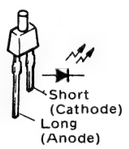
GL-5NP5(B/C)



SEL1321G(Green)
SEL1121R(Red)

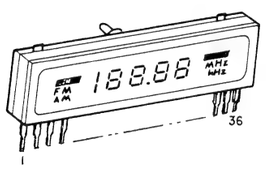


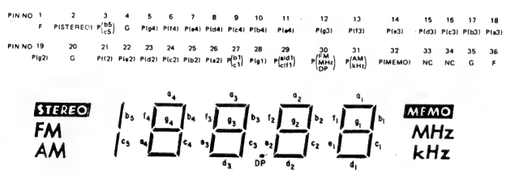
SEL1112R(Red)



• ELECTRON RAY INDICATOR TUBE

FIP7F8S





OPERATING PRINCIPLE OF THE SSS (SUPER SEARCHER SYSTEM)

When radio signals of more than two stations on one band enter, a false radio wave will arise at another point. (Assuming two stations.) This false wave causes intermodulation interference. If receiving a station with the same frequency of the false radio wave, reception is accompanied by intermodulation interference noise, and various other interference.

Fig.14 shows how intermodulation interference occurs, and how to make interference-free reception. Two false radio waves, D1 and D2, arise each from one of two radio wave frequencies of stations (A and B). These false waves cause intermodulation interference for reception with station C. If station C's frequency is the same as false frequency D1, it is normally impossible to isolate the false wave. But with the DRA-750, the band eliminate filter, removes false radio wave D1 and D2 from station A or B. Therefore, any audio system employing this Model is assured of quality reception, free from intermodulation interference.

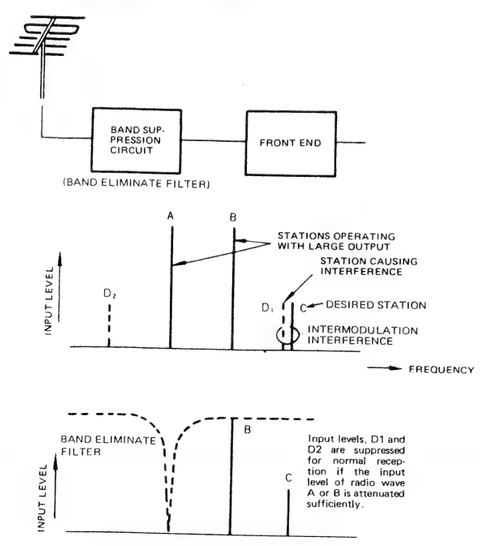
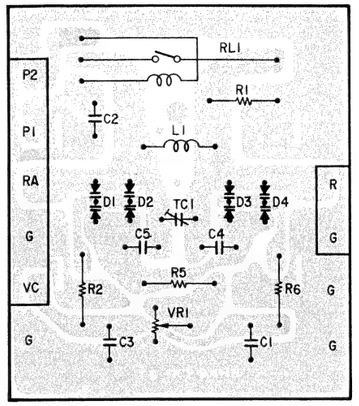


Fig. 14

PRINTED WIRING BOARD PATTERNS AND PARTS LIST

ETC0658J TRAP UNIT



ETC0658J TRAP UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
D001 ~004	2760366008	SVC211SP-B TWIN VARACTOR
		RESISTORS
R001, 002	2412148008	220k ohm ±5% 1/4W CARBON
R005	2412089002	750 ohm ±5% 1/4W CARBON
R006	2412148008	220k ohm ±5% 1/4W CARBON
VR001	EP-5462H11	SOLID VR 4.7k ohm
		CAPACITORS
C002, 003	2531024003	0.01μF +80,—20% 50V CERAMIC
C004, 005	2533469006	10pF ±0.5pF 50V CERAMIC
TC001	2130034009	TRIMMER CON. (CTZ-51C)
		OTHER PARTS
	2221003004	P.W. BOARD
	4140328004	SHIELD CASE
RL001	2140052000	REED RELAY (L13M)
L001	RT-11653	FM OSC COIL
	2050087026	2P TERMINAL
	2050087055	5P TERMINAL

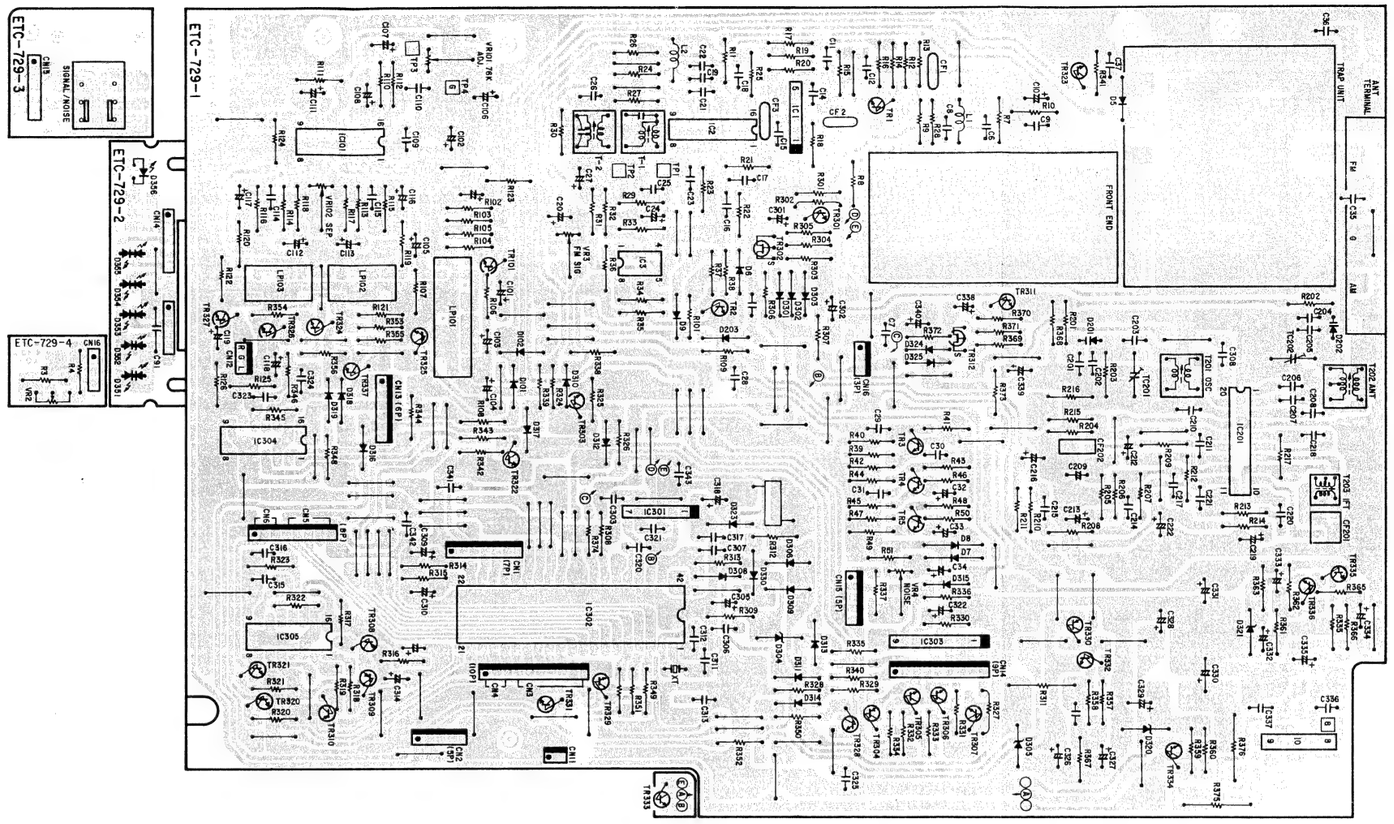
NOTE: If D001, D002, D003 and D004 are to be replaced, be sure to replace them in pairs.

ETC0729H TUNER UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	
		SEMICONDUCTORS	
IC001	2630099007	TA-7060AP	IC (TOSHIBA)
IC002	2630083000	HA11225	IC (HITACHI)
IC003	2650030004	NJM4558DD	IC (JRC)
IC101	2630123009	HA-12016	IC (HITACHI)
IC201	2630145003	LA1245	IC (SANYO)
IC301	2630232000	TD6104P	IC (TOSHIBA)
IC302	2620452104	TC9147BP	IC (TOSHIBA)
IC303	2630221008	LB1403	IC (SANYO)
IC304, 305	2620343006	HD14027B	IC (HITACHI)
TR001	2730025023	2SC461(C)	TRANSISTOR
TR002 ~005	2730294016	2SC1685(R)	TRANSISTOR
TR101	2730294016	2SC1685(R)	TRANSISTOR
TR301	2730294016	2SC1685(R)	TRANSISTOR
TR302	2750020008	2SK163(M)	FET
TR303	2730294016	2SC1685(R)	TRANSISTOR
TR304	2710178039	2SA564A(R)	TRANSISTOR
TR305 ~307	2730294016	2SC1685(R)	TRANSISTOR
TR308 ~310	2710178039	2SA564A(R)	TRANSISTOR
TR320 ~327	2730294016	2SC1685(R)	TRANSISTOR
TR328	2710178039	2SA564A(R)	TRANSISTOR
TR329	2730294016	2SC1685(R)	TRANSISTOR
TR330	2710178039	2SA564A(R)	TRANSISTOR
TR331	2730294016	2SC1685(R)	TRANSISTOR
TR332	2740078031	2SD882(Q/P)	TRANSISTOR
TR333	2740088018	2SD1406(Y)/(GR)	TRANSISTOR
TR334 ~336	2730294016	2SC1685(R)	TRANSISTOR
TR337	2710178039	2SA564A(R)	TRANSISTOR
D005, 006	2760049011	1S2076A	DIODE
D007, 008	2760002003	1N60	DIODE
D009	2760049011	1S2076A	DIODE
D101, 102	2760049011	1S2076A	DIODE
D201, 202	2760302004	SVC321SP-D2	VARACTOR
D203	2760049011	1S2076A	DIODE
D301 ~303	2760049011	1S2076A	DIODE
D304	2760218033	HZ9B2	ZENER
D305	2760173039	HZ6-B2	ZENER
D306 ~319	2760049011 (EXCEPT D307)	1S2076A	DIODE
D320	2760256008	HZ-16-2	ZENER
D321	2760051070	HZ7C-2	ZENER
D322	2760239009	S1RBA20F	DIODE
D323	2760049011	1S2076A	DIODE
D330	2760049011	1S2076A	DIODE
D351 ~355	3939237006	GL5NP5(B/C) (RED/GREEN)	LED
D356	3939261014	SEL1321G (GREEN)	LED
		RESISTORS (not included Carbon Film ±5%, 1/4W Type)	
⚠R123	2412321061	47 ohm ±5% 1/4W	CARBON (NB)
⚠R311	2440031022	150 ohm ±5% 1W	METAL OXIDE FILM (NB)
⚠R334	2412314052	82 ohm ±5% 1/4W	CARBON (NB)
⚠R364	2412314023	470 ohm ±5% 1/4W	CARBON (NB)

Ref. No.	Part No.	Part Name & Descriptions
⚠R375, 376	2440005029	1 ohm ±5% 1W METAL OXIDE FILM (NB)
VR002	2110404002	PUSH LOCK VR 100k ohm
VR003, 004	2116000073	SEMI FIXED RESISTOR 20k ohm
VR101	2116000099	SEMI FIXED RESISTOR 2k ohm
VR102	2116000086	SEMI FIXED RESISTOR 200k ohm
		CAPACITORS (not included Ceramic ±5%, ±10%, 50V Type)
C006	2551072006	0.01μF ±10% 50V PLASTIC FILM
C007 ~009	2531024003	0.01μF +80,–20% 50V CERAMIC
C011	2531024003	0.01μF +80,–20% 50V CERAMIC
C014 ~017	2531024003	0.01μF +80,–20% 50V CERAMIC
C019	2531024003	0.01μF +80,–20% 50V CERAMIC
C020	2544145005	0.47μF 50V ELECTROLYTIC
C021	2531025002	0.022μF +80,–20% 50V CERAMIC
C022	2531024003	0.01μF +80,–20% 50V CERAMIC
C024	2544146004	1μF 50V ELECTROLYTIC
C025, 026	2531024003	0.01μF +80,–20% 50V CERAMIC
C027	2544136001	100μF 16V ELECTROLYTIC
C032, 033	2544145005	0.47μF 50V ELECTROLYTIC
C034	2544146004	1μF 50V ELECTROLYTIC
C036, 037	2531024003	0.01μF +80,–20% 50V CERAMIC
C101	2544148002	3.3μF 50V ELECTROLYTIC
C102	2544021006	470μF 16V ELECTROLYTIC
C103, 104	2544132005	10μF 16V ELECTROLYTIC
C105	2544148002	3.3μF 50V ELECTROLYTIC
C106	2544146004	1μF 50V ELECTROLYTIC
C107	2544148002	3.3μF 50V ELECTROLYTIC
C108	2544146004	1μF 50V ELECTROLYTIC
C109	2551122008	0.047μF ±5% 50V PLASTIC FILM
C110	2556099000	0.001μF ±5% 50V PLASTIC FILM
C111	2544148002	3.3μF 50V ELECTROLYTIC
C112, 113	2544133004	22μF 16V ELECTROLYTIC
C114, 115	2551120013	0.0012μF ±5% 50V PLASTIC FILM
C116, 117	2544148002	3.3μF 50V ELECTROLYTIC
C118, 119	2544089006	1μF ±20% 50V ELECTROLYTIC
C201	2531024003	0.01μF +80,–20% 50V CERAMIC
C202	2533603008	10pF ±0.5pF 50V CERAMIC
C203	2556089007	390pF ±5% 50V PLASTIC FILM
C204	2531024003	0.01μF +80,–20% 50V CERAMIC
C205	2533600001	7pF ±0.5pF 50V CERAMIC
C206, 207	2531024003	0.01μF +80,–20% 50V CERAMIC
C208	2531026001	0.047μF +80,–20% 50V CERAMIC
C209	2544140000	4.7μF 35V ELECTROLYTIC
C210, 211	2531024003	0.01μF +80,–20% 50V CERAMIC
C212	2544146004	1μF 50V ELECTROLYTIC
C213	2544147003	2.2μF 50V ELECTROLYTIC
C214	2531024003	0.01μF +80,–20% 50V CERAMIC
C215	2551076002	0.022μF ±10% 50V PLASTIC FILM
C216	2544163003	220μF 16V ELECTROLYTIC
C217, 218	2531024003	0.01μF +80,–20% 50V CERAMIC
C219	2544132005	10μF 16V ELECTROLYTIC
C220	2531024003	0.01μF +80,–20% 50V CERAMIC
C222	2544136001	100μF 16V ELECTROLYTIC

ETC0729H TUNER UNIT

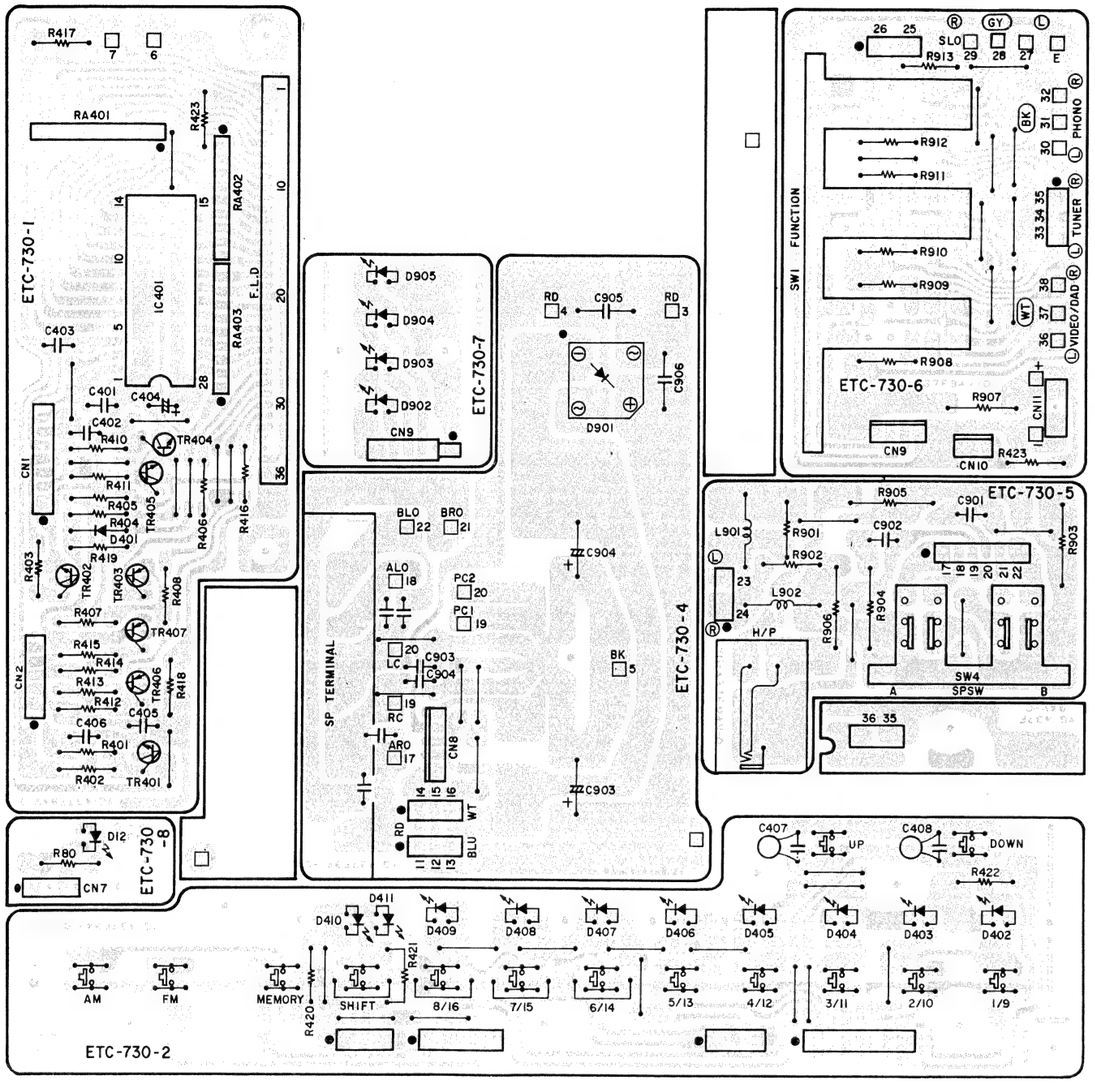


Ref. No.	Part No.	Part Name & Descriptions
C301	2541029001	1μF ±20% 35V TANTALUM
C302	2544139008	100μF 25V ELECTROLYTIC
C303	2551072006	0.01μF ±10% 50V PLASTIC FILM
C304	—	—
C305	2544161047	470μF 6.3V ELECTROLYTIC
C306 ~308	2531024003	0.01μF +80,–20% 50V CERAMIC
C309, 310	2544147003	2.2μF 50V ELECTROLYTIC
C313	2531024003	0.01μF +80,–20% 50V CERAMIC
C314	2544017007	47μF 16V ELECTROLYTIC
C315, 316	2531025002	0.022μF +80,–20% 50V CERAMIC
C317	2531024003	0.01μF +80,–20% 50V CERAMIC
C318	2544129005	47μF 10V ELECTROLYTIC
C320, 321	2531024003	0.01μF +80,–20% 50V CERAMIC
C322	2544140000	4.7μF 35V ELECTROLYTIC
C323, 324	2531025002	0.022μF +80,–20% 50V CERAMIC
C325	2531024003	0.01μF +80,–20% 50V CERAMIC
C326 ~328	2544136001	100μF 16V ELECTROLYTIC
C329	2544029008	220μF 25V ELECTROLYTIC
C330	2544086009	2200μF ±20% 25V ELECTROLYTIC
C331	2544159004	100μF 35V ELECTROLYTIC
C332	2544132005	10μF 16V ELECTROLYTIC

Ref. No.	Part No.	Part Name & Descriptions
C333	2544148002	3.3μF 50V ELECTROLYTIC
C334, 335	2544059049	22μF 63V ELECTROLYTIC
C336, 337	2531024003	0.01μF +80,–20% 50V CERAMIC
C341, 342	2531026001	0.047μF +80,–20% 50V CERAMIC
TC201, 202	2130022008	TRIMMER CONDENSER
		COILS, TRANS
T001	2312901002	FM IF DET (A) (50kHz)
T002	2312902001	FM IF DET (B) (50kHz)
T201	2311076103	MW OSC COIL
T202	2311061008	MW ANT TRANS
T203	2310056001	AM IFT
LP101	2320069004	ANTI BIRDIE FILTER (114kHz)
LP102, 103	2320041006	LOW PASS FILTER (19kHz, 38kHz)
CF001	2610038004	FM C. FILTER (10.7M A8)
CF002, 003	2610023006	FM C. FILTER (SFE10.7MHz A)
CF201	2610034008	AM C. FILTER (SEP450H)
CF202	2610031001	AM C. FILTER (BFU450C4)
XT	3990008038	X-TAL (7.2MHz)

Ref. No.	Part No.	Part Name & Descriptions	
L001, 002	2350015043	INDUCTOR (2.2mH)	
	2169002002	FRONT END	
		OTHER PARTS	
	2221080108	P.W. BOARD	1
	EP-5667H1	TERMINAL PIN	9
	2090008120	JUMPER WIRE P=10mm	86
	2050190023	2P NH CONNECTOR BASE	1
	2050190036	3P NH CONNECTOR BASE	2
	2050190052	5P NH CONNECTOR BASE	2
	2050190065	6P NH CONNECTOR BASE	1
	2050190078	7P NH CONNECTOR BASE	1
	2050190081	8P NH CONNECTOR BASE	1
	2050190094	9P NH CONNECTOR BASE	1
	2050190007	10P NH CONNECTOR BASE	1
	2050241037	3P CONNECTOR PIN ASS'Y	1
	2050185038	3P WIRE HOLDER	3
	2050185041	4P WIRE HOLDER	1
	2050185054	5P WIRE HOLDER	2
	2030225060	1P CONTACT ASS'Y	1
	2034203062	3P CONNECTOR CORD	1
	2038109010	5P CONNECTOR CORD	1
	2042093002	9P CONNECTOR CORD	1
	2124458002	SLIDE SW (SCL-202)	1
	2050208009	3P NJ ANT TERMINAL	1
	3940005007	LITHIUM BATTERY	1

ETC0730Q CONTROL UNIT



ETC0730Q CONTROL UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
IC401	2620453006	TD6301AP	IC (TOSHIBA)
TR401, 402	2730294016	2SC1685(R)	TRANSISTOR
TR403	2710178039	2SA564A(R)	TRANSISTOR
TR404, 405	2730294016	2SC1685(R)	TRANSISTOR
TR406, 407	2710178039	2SA564A(R)	TRANSISTOR

Ref. No.	Part No.	Part Name & Descriptions	
D402 ~409	3939261001	SEL1121R(RED)	LED
D410, 411	3939260002	SEL1112R(RED)	LED
D901	2760338007	S4VB20F	DIODE
D902 ~905	3939261014	SEL1321G(GREEN)	LED
	3934009019	FIP7F8S DISPLAY	

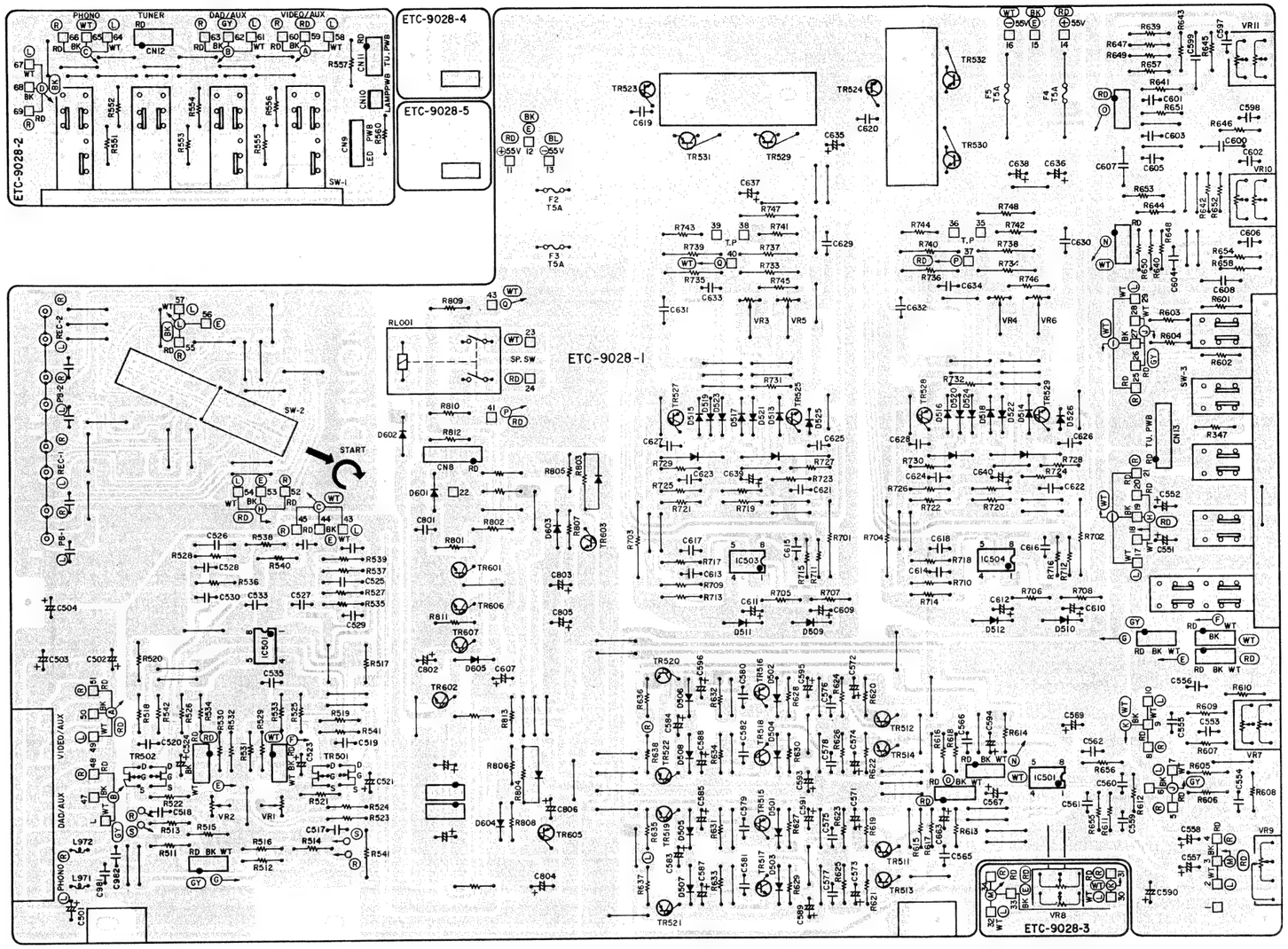
Ref. No.	Part No.	Part Name & Descriptions			
RESISTORS					
R401 ~404	2412130003	39k ohm	±5%	1/4W	CARBON
R405 ~409	2412116001	10k ohm	±5%	1/4W	CARBON
R410 ~415	2412130003	39k ohm	±5%	1/4W	CARBON
R416	2412116001	10k ohm	±5%	1/4W	CARBON
R417, 418	2412076002	220 ohm	±5%	1/4W	CARBON
R419	2412130003	39k ohm	±5%	1/4W	CARBON
R420	2412087004	620 ohm	±5%	1/4W	CARBON
R421	2412108006	4.7k ohm	±5%	1/4W	CARBON
R422	2412087004	620 ohm	±5%	1/4W	CARBON
R423	2412110007	5.6k ohm	±5%	1/4W	CARBON
R901, 902	2412060005	47 ohm	±5%	1/4W	CARBON
⚠R903, 904	2440021029	22 ohm	±5%	1W	METAL OXIDE FILM (NB)
⚠R905, 906	2440033020	220 ohm	±5%	1W	METAL OXIDE FILM (NB)
RA401 ~403	2462012003	10k ohm x 8	±20%	1/8W	RESISTOR ARRAY
CAPACITORS					
C401 ~403	2531006005	2200pF	±10%	50V	CERAMIC
C407	2533633007	180pF	±5%	50V	CERAMIC
C901, 902	2551121067	0.022μF	±5%	50V	PLASTIC FILM
C903, 904	2546074006	10,000μF	±20%	63V	ELECTROLYTIC
C905	2531053003	0.01μF	+100,−0%	500V	CERAMIC
C951 ~954	2531008003	4700pF	±10%	50V	CERAMIC
SWITCHES, COILS					
	2124407008	TACT SWITCH (USED 14)			
	2124499003	2P PUSH SWITCH (SP A/B)			
L901, 902	2359001004	INDUCTOR (1μH)			
OTHER PARTS					
	2221081204	P.W. BOARD			1
	EP-5667H1	TERMINAL PIN L=21			16
	2090008120	JUMPER WIRE P=10mm			31
	2050151004	8P PUSH TERMINAL (SP OUTPUT)			1
PL001	3930064003	PILOT LAMP			1
	1460703108	LED GUIDE			1
	2048100009	HEADPHONE JACK			1
	4770210016	PUSH RIVET			3
	2050185038	3P WIRE HOLDER			5
	2050185041	4P WIRE HOLDER			1
	2050185054	5P WIRE HOLDER			2
	2050185067	6P WIRE HOLDER			1
	2050185070	7P WIRE HOLDER			2
	2050190052	5P NH CONNECTOR BASE			1
	2032154016	2P CONNECTOR CORD			1
	2038109007	5P CONNECTOR CORD			1
	2038109078	5P CONNECTOR CORD			1
	2042052001	7P CONNECTOR CORD			1
	2042096009	8P CONNECTOR CORD			1
	2042090005	10P CONNECTOR CORD			1

ETC9028 POWER PRE UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	
SEMICONDUCTORS			
IC501	2630081015	NJM4558DX	IC (JRC)
IC502	2630205008	NJM2041DD	IC (JRC)
IC503, 504	2630257001	M-5218P	IC (MITSUBISHI)
TR501, 502	2750029025	2SK240(BL)/(V)	FET
TR511, 512	2710131021	2SA988(E/F)	TRANSISTOR
TR513, 514	2730235020	2SC1841(E/F)	TRANSISTOR
TR515, 516	2710131021	2SA988(E/F)	TRANSISTOR
TR517 ~520	2730235020	2SC1841(E/F)	TRANSISTOR
TR521, 522	2710131021	2SA988(E/F)	TRANSISTOR
TR523, 524	2730198015	2SC1815(BL)	TRANSISTOR
TR525, 526	2730236029	2SC2824(Y/O)	TRANSISTOR
TR527, 528	2710135027	2SA1184(Y/O)	TRANSISTOR
TR529, 530	2730273011	2SC2581(O)/(Y)	TRANSISTOR
TR531, 532	2710160018	2SA1106(O)/(Y)	TRANSISTOR
TR601, 602	2730198015	2SC1815(BL)	TRANSISTOR
TR603	2740060007	2SD667A(C)	TRANSISTOR
TR605	2720053005	2SB647A(C)	TRANSISTOR
TR606, 607	2730294016	2SC1685(R)	TRANSISTOR
D501 ~508	2760049011	1S2076A	DIODE
D509 ~512	2760253001	HZ15-2	ZENER
D513 ~524	2760049011	1S2076A	DIODE
D525, 526	2760049008	1S2076	DIODE
D601, 602	2760049011	1S2076A	DIODE
D603, 604	2760301005	HZ22-2	ZENER
RESISTORS (not included Carbon Film ±5%, 1/4W Type)			
⚠R068, 069	2412321032	4.7 ohm	±5% 1/4W CARBON (NB)
R541	2410177000	470 ohm	±5% 1/2W CARBON
R557	2410181009	680 ohm	±5% 1/2W CARBON
⚠R560	2412321016	22 ohm	±5% 1/4W CARBON (NB)
⚠R627 ~630	2412314081	560 ohm	±5% 1/4W CARBON (NB)
⚠R631 ~634	2412314007	100 ohm	±5% 1/4W CARBON (NB)
⚠R635 ~638	2412321061	47 ohm	±5% 1/4W CARBON (NB)
⚠R701 ~704	2440103028	2.7k ohm	±5% 2W METAL OXIDE FILM (NB)
⚠R705, 706	2412321003	1k ohm	±5% 1/4W CARBON (NB)
⚠R709, 710	2412321003	1k ohm	±5% 1/4W CARBON (NB)
⚠R723 ~726	2412321003	1k ohm	±5% 1/4W CARBON (NB)
⚠R731, 732	2412314081	560 ohm	±5% 1/4W CARBON (NB)

Ref. No.	Part No.	Part Name & Descriptions
⚠R733 ~740	2442013093	0.33 ohm ±5% 1W METAL OXIDE FILM (NB)
⚠R747, 748	2440021029	22 ohm ±5% 1W METAL OXIDE FILM (NB)
⚠R803, 804	2440038025	560 ohm ±5% 1W METAL OXIDE FILM (NB)
⚠R812	2412314010	390 ohm ±5% 1/4W CARBON (NB)
VR501, 502	EP-5462H1	100 ohm SOLID VR
VR503, 504	2116028000	10k ohm SEMI FIXED RESISTOR
VR505, 506	2116028013	200 ohm SEMI FIXED RESISTOR
VR507	2110433002	100k ohm VARIABLE RESISTOR
VR508	2110432100	100k ohm VARIABLE RESISTOR
VR509	2110434001	250k ohm VARIABLE RESISTOR
VR510	2110435000	50k ohm VARIABLE RESISTOR
VR511	2110435013	250k ohm VARIABLE RESISTOR
CAPACITORS (not included Ceramic ±5%, ±10%, 50V Type)		
C501 ~504	2544146004	1μF 50V ELECTROLYTIC
C521	2544136001	100μF 16V ELECTROLYTIC
C523, 524	2549012023	47μF 16V ELECTROLYTIC
C525, 526	2551122024	0.068μF ±5% 50V PLASTIC FILM
C527, 528	2551120000	0.001μF ±5% 50V PLASTIC FILM
C529, 530	2551121054	0.018μF ±5% 50V PLASTIC FILM
C533	2531025002	0.022μF +80,–20% 50V CERAMIC
C535	2531025002	0.022μF +80,–20% 50V CERAMIC
C551, 552	2549014018	0.22μF ±20% 50V ELECTROLYTIC
C555, 556	2551121067	0.022μF ±5% 50V PLASTIC FILM
C557, 558	2544146004	1μF 50V ELECTROLYTIC
C563, 564	2544132005	10μF 16V ELECTROLYTIC
C565, 566	2533603008	10pF ±0.5pF 50V CERAMIC
C567	2544146004	1μF 50V ELECTROLYTIC
C569	2544146004	1μF 50V ELECTROLYTIC
C571 ~574	2544180028	10μF ±20% 63V ELECTROLYTIC
C579 ~582	2534285001	47pF ±5% 500V CERAMIC
C583 ~588	2544146004	1μF 50V ELECTROLYTIC
C589	2544203002	1μF ±20% 160V ELECTROLYTIC
C590	2531024003	0.01μF +80,–20% 50V CERAMIC
C591	2544203002	1μF ±20% 160V ELECTROLYTIC
C593	2544203002	1μF ±20% 160V ELECTROLYTIC
C595	2544203002	1μF ±20% 160V ELECTROLYTIC
C597, 598	2551121041	0.015μF ±5% 50V PLASTIC FILM
C599, 600	2551122053	0.12μF ±5% 50V PLASTIC FILM
C603, 604	2551121009	0.0068μF ±5% 50V PLASTIC FILM
C607, 608	2551122011	0.056μF ±5% 50V PLASTIC FILM
C609 ~612	2544151002	22μF 50V ELECTROLYTIC
C619, 620	2544132005	10μF 16V ELECTROLYTIC
C625, 626	2534285001	47pF ±5% 500V CERAMIC
C627, 628	2534283003	39pF ±5% 500V CERAMIC

ETC9028 POWER PRE UNIT

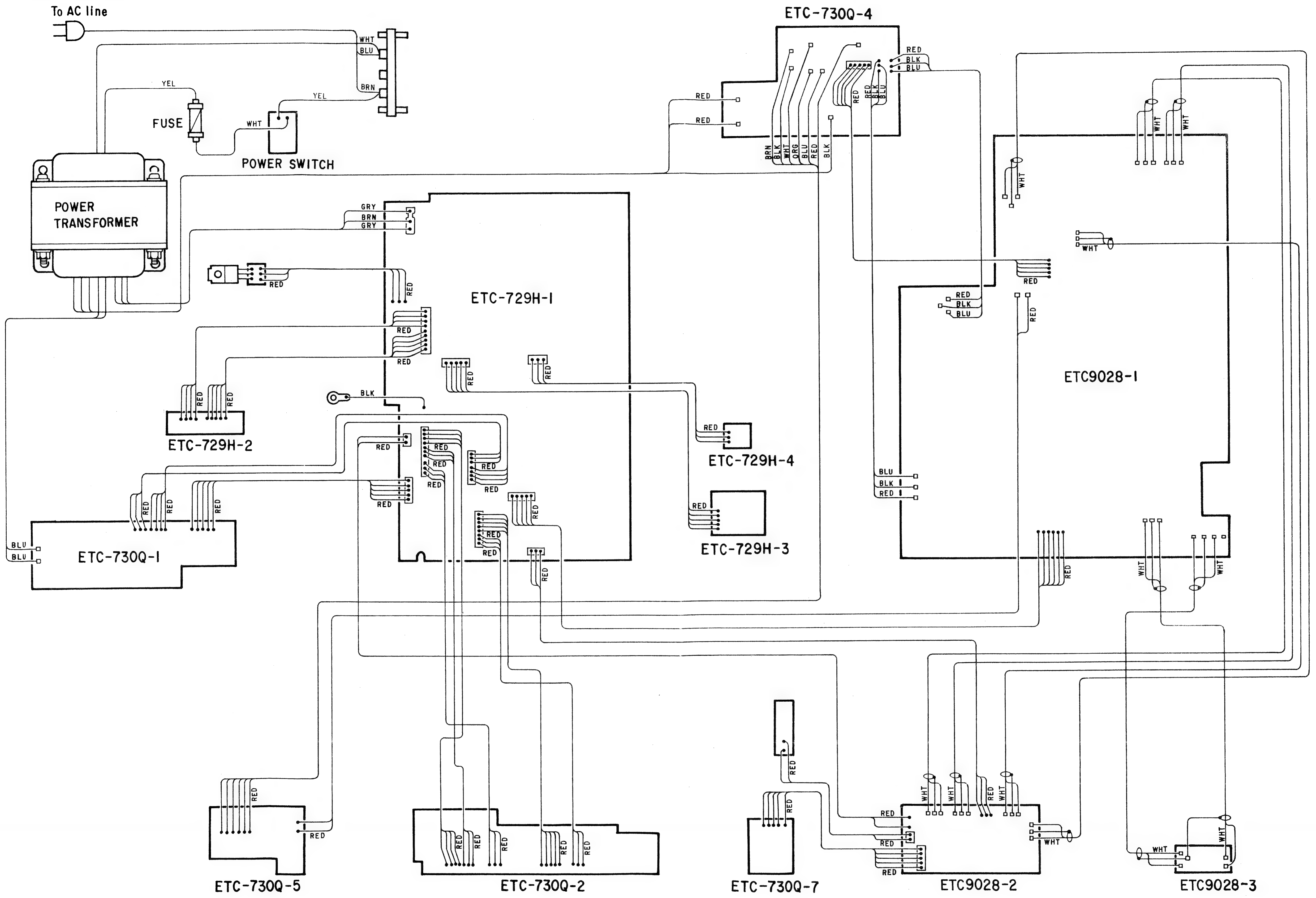


Ref. No.	Part No.	Part Name & Descriptions
C629 ~632	2551121067	0.022μF ±5% 50V PLASTIC FILM
C633, 634	2551121025	0.01μF ±5% 50V PLASTIC FILM
C635 ~638	2544203002	1μF ±20% 160V ELECTROLYTIC
C639, 640	2544146004	1μF 50V ELECTROLYTIC
C801	2544181001	1μF ±20% 100V ELECTROLYTIC
C802	2544127007	220μF 6.3V ELECTROLYTIC
C803, 804	2544089022	100μF 50V ELECTROLYTIC
C805, 806	2544146004	1μF 50V ELECTROLYTIC
C807	2544163003	220μF 16V ELECTROLYTIC
SWITCH, RELAY, COIL		
RL001	2140037009	RELAY

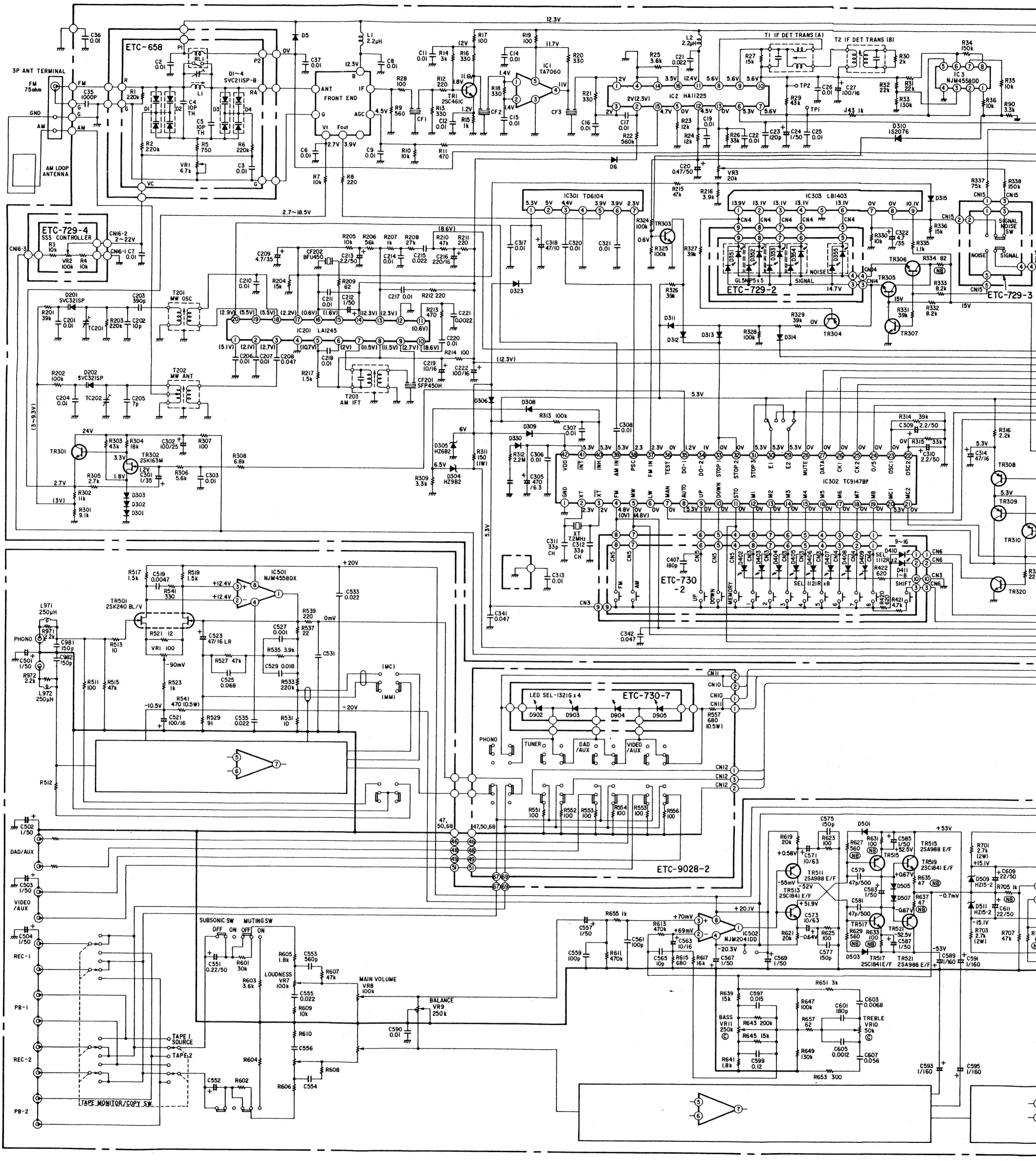
Ref. No.	Part No.	Part Name & Descriptions	
L971, 972	2359003002	FTZ CHOKE COIL	
	2124254002	SLIDE SW (REMOTE)	
	2124503009	INPUT SELECTOR SW.	
	2124500002	5P PUSH SWITCH	
OTHER PARTS			
	2229035003	P.W. BOARD	1
	EP-5667H1	TERMINAL PIN L=21	62
	2090008146	JUMPER WIRE P=5	3
	2090008120	JUMPER WIRE P=10	116
	2020022008	FUSE HOLDER	8
F502 ~505	2061040036	FUSE 5A F	4
	4140240001	EARTH PLATE	2
	4170234003	RADIATOR BLOCK	2
	2050185038	3P WIRE HOLDER	12
	5139119032	FUSE LABEL 5AF	4

Ref. No.	Part No.	Part Name & Descriptions	
	2050185054	5P WIRE HOLDER	1
	2050185067	6P WIRE HOLDER	1
	2050133022	2P NH CONNECTOR BASE	1
	2050133051	5P NH CONNECTOR BASE	1
	2050152003	6P CONNECTOR BASE	1
	2050150005	4P CONNECTOR BASE	2
	2030241057	1P CONTACT ASS'Y	1
	2032115000	2P CONNECTOR CORD	1
	2034203075	3P CONNECTOR CORD	1
	2038123038	5P CONNECTOR CORD	1
	2040094029	6P CONNECTOR	1
	4700012022	CROSS PAN SCREW WITH S, WASHER 3×12	4
	4737002018	TAPPING SCREW (S) 3×8	4
	4159001008	F.S. WASHER	4

WIRING DIAGRAM



SCHEMATIC DIAGRAM



⚠ ▩ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

ETC-730-1

ETC-729-2

ETC-728-1

ETC-729-3

ETC-729-1

ETC-9028-1

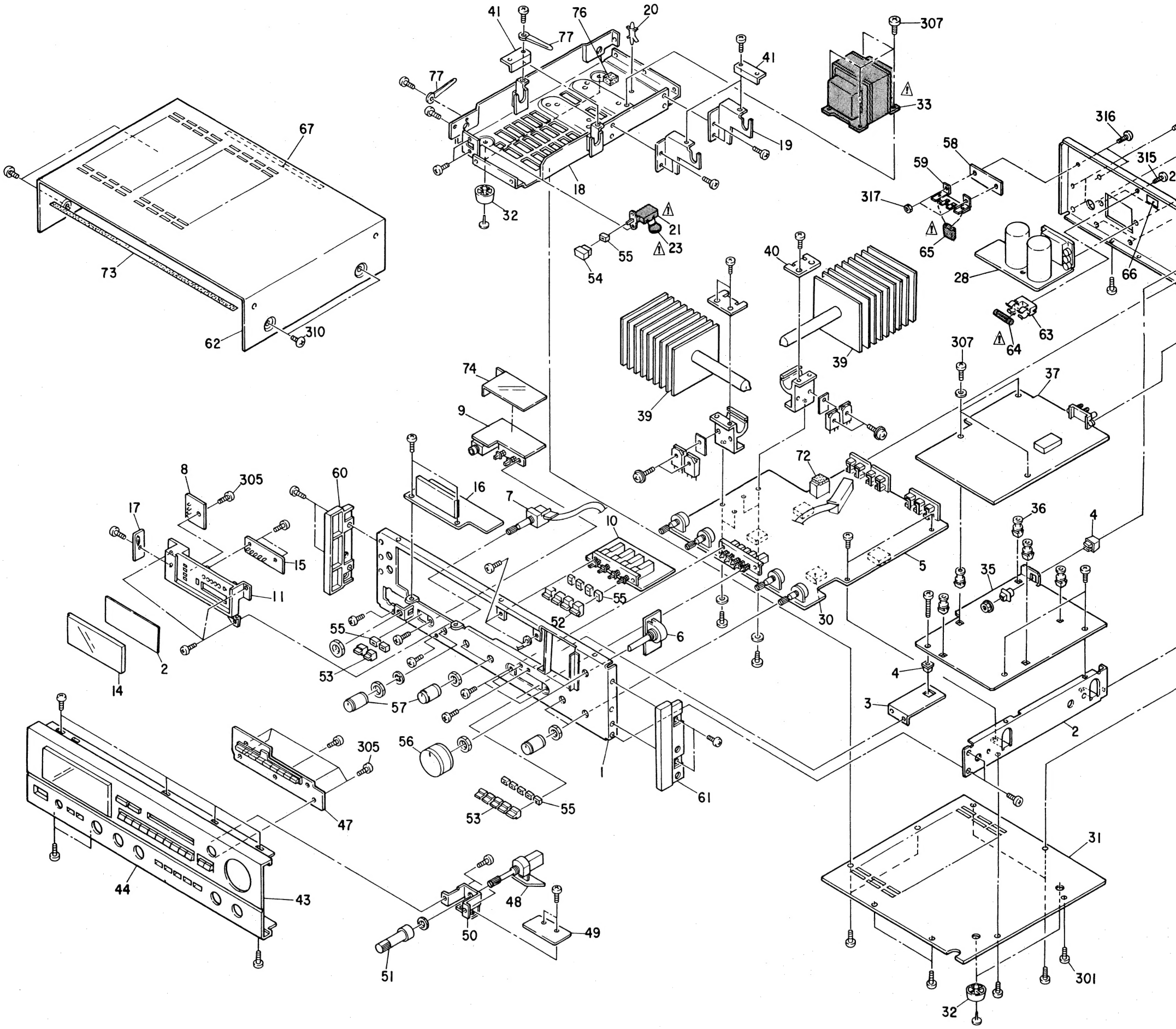
ETC-730-5

ETC-730-4

UNLESS OTHERWISE SPECIFIED, ALL SEMICONDUCTOR WITHOUT TYPE NUMBER ARE IS2076A/2SC1685/2SA564A
VOLTAGE : MEASURED AT FM 87.5MHz NO SIGNAL INPUT
( ) MEASURED AT AM 522kHz NO SIGNAL INPUT

NOTES
ALL RESISTANCE VALUES IN OHM K = 1,000 OHM M = 1,000,000 OHM
ALL CAPACITANCE VALUES IN MICRO FARAD P = MICRO-MICRO FARAD
EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

EXPLODED VIEW OF CHASSIS AND CABINET



EXPLODED VIEW OF CHASSIS AND CABINET PARTS LIST (Gold Version)

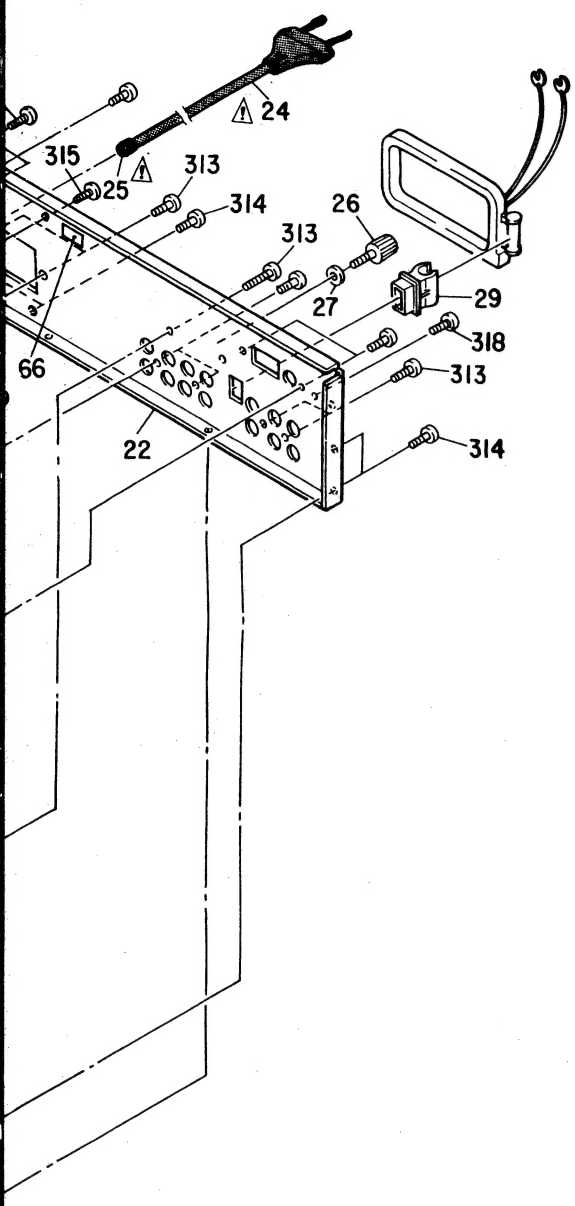
Ref. No.	Part No.	Part Name & Descriptions
1	4110430003	FRONT CHASSIS ASS'Y
2	4110422008	SIDE CHASSIS
3	4121647102	BRACKET (F.C)
4	4150286000	P.C.B. HOLDER
5	ETC9028-1	POWER PRE AMP UNIT
6	ETC9028-3	MAIN VR UNIT
7	2124505007	ROTARY REMOTE SW
8	ETC0730Q	CONTROL UNIT
9	ETC0730Q-4	SP SW & H.P UNIT
10	ETC9028-2	FUNCTION SW UNIT
11	1460695203	LED HOLDER
12	1430370105	INDICATION SHEET
13	–	–
14	1430369006	INSIDE PLATE
15	ETC0729H-3	SIGNAL UNIT
16	ETC0730Q7	F. LED UNIT
17	ETC0730Q9	LAMP UNIT
18	4110424200	TRANS CHASSIS ASS'Y
19	4121645007	H.P BRACKET (R)
20	4150228000	P.C.B. HOLDER
⚠ 21	2124409006	POWER SWITCH
22	1059034000	BACK PANEL
⚠ 23	2538003014	CERAMIC CAP 0.0047μF/400V AC(C-911)
⚠ 24	2062002031	AC CORD WITH PLUG
⚠ 25	4450020005	CORD BUSH

Ref. No.	Part No.	Part Name & Descriptions
26	2050071016	TERMINAL ASS'Y
27	4770018001	WASHER (P-87)
28	ETC0730Q5	SP TERMINAL UNIT
29	1460494006	ANTENNA HOLDER
30	4610114023	CUSHION
31	1050608008	BOTTOM COVER
32	1040111000	FOOT
⚠ 33	2339528002	POWER TRANS
34	4450033005	WIRE CLAMP BAND 18
35	4140363108	SHIELD PLATE
36	4150283003	P.C.B. HOLDER
37	ETC0729H	TUNER UNIT
38	ETC0658J	TRAP UNIT
39	4170232209	H.P RADIATOR
40	4121646006	RADIATOR BRACKET
41	4121648004	BRACKET
42	ETC0729H-5	TR UNIT
*43	1441240208	FRONT PANEL ASS'Y
*44	1130601103	PUSH KNOB ASS'Y
*45	1430374402	ESC BAR (L)
*46	1430375304	ESC BAR (R)
47	ETC0730Q2	KEY LED UNIT
48	ETC0729H-3	SSS SW UNIT
49	ETC0729H-4	SSS VR UNIT
50	4121484103	VOLUME BRACKET

Ref. No.	Part No.	Part Name & Descriptions
*51	1130503104	KNOB ASS'Y (SSS)
*52	1130604100	PUSH KNOB FOR FUNCTION
*53	1130536029	PUSH KNOB FOR SP. MC. MUT
*54	1130515134	PUSH KNOB (A) FOR POWER
55	1140056007	FLEXIBLE RING
*56	1120458104	KNOB ASS'Y FOR MAIN VR
*57	1120459103	KNOB ASS'Y FOR TONE, TAPE
58	4150088004	INSULATING SHEET
59	2050089008	7P W/TERMINAL
*60	1460338230	ESC PLATE (L)
*61	1460339239	ESC PLATE (R)
*62	1020178115	TOP COVER
63	2020013101	FUSE HOLDER
⚠ 64	2061015074	FUSE (3.15A)
⚠ 65	2568023006	METALIZED CAP. 0.01μF/250V AC(C-910)
66	5130654059	FUSE LABEL (T3.15A)
67	1229006017	SPACER (220x5x0.5T)
68	–	–
69	–	–
70	–	–
71	–	–
72	–	–
73	1229006004	SPACER (420x11x0.5T)
74	4150287009	ISOLATION SHEET
75	–	–

Ref. No.
76
77
78
79
80
81
82
83
PACK
*a.
b.
c.
d.
e.
f.
g.
h.
i.
j.
k.
l.

⚠ ▩ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



NIPPON COLUMBIA CO., LTD.
No. 14-14, 4-CHOME AKASAKA,
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CABLE: NIPPONCOLUMBIA TOKYO

Printed in Japan

Ref. No.	Part No.	Part Name & Descriptions
76	4610114007	CUSHION
77	4450048016	CORD HOLDER
78	1439003004	BLIND SHEET
79	1439003017	BLIND SHEET
80		
81		
82		
83		
PACKING & ACCESSORIES (not included EXPLODED VIEW)		
*a.	5019122000	CARTON CASE
b.	5030448103	CUSHION
c.	5058092049	LAMINATE ENVELOPE
d.	–	–
e.	5050061007	ENVELOPE
f.	5119139003	INST. MANUAL
g.	–	–
h.	–	–
i.	2311060009	LOOP ANTENNA
j.	5290040008	FM ANT ADAPTOR
k.		
l.		

Ref. No.	Part No.	Part Name & Descriptions	
SCREWS, NUTS & WASHERS			
301	4737002005	TAPPING SCREW (S) 3x6	60
302	–	NUT M7 (SP)	7
303	–	TOOTH WASHER ϕ7	1
304	–	NUT M12 (SP)	1
305	4737500015	TAPPING SCREW (P) 3x8	9
306	–	–	–
307	4737004003	TAPPING SCREW (S) 4x8	7
308	–	–	–
309	–	–	–
* 310	4734801005	TAPPING SCREW (TRUSS) 4x8	4
311	4751006016	WASHER ϕ5 (BLACK)	3
312	–	–	–
313	4737500044	TAPPING SCREW (P) 3x8 (BLACK)	10
314	4737002034	TAPPING SCREW (S) 3x6 (BLACK)	6
315	4734453039	TAPPING SCREW 4x6 (BLACK)	1
316	4700042005	PAN SCREW 3x8 (BLACK)	2
317	4756006008	NUT M3	2
318	4770064107	FIXING SCREW	1

BLACK VERSION PARTS LIST
(Same as GOLD VERSION except the followings)

Ref. No.	Part No.	Part Name & Descriptions
43	1441240211	FRONT PANEL ASS'Y
44	1130601116	PUSH KNOB ASS'Y
45	1430374321	ESC BAR (L)
46	1430375317	ESC BAR (R)
51	1130503117	KNOB ASS'Y (SSS)
52	1130604126	PUSH KNOB FOR FUNCTION
53	1130536045	PUSH KNOB (B) FOR SP, MC, MUT
54	1139030102	PUSH KNOB (A) FOR POWER
56	1120458120	KNOB ASS'Y FOR MAIN VR
57	1120459129	KNOB ASS'Y FOR TONE, TAPE
60	1460338256	ESC PLATE (L)
61	1460339255	ESC PLATE (R)
62	1020178131	TOP COVER
310	4734454038	TAPPING SCREW (TRUSS) 4x8 (BLACK)
a.	5019122000	CARTON CASE